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QUALIFYING FOR THE PROFESSION.

BION J. ARNOLD, the well-known mechanical engineer of Chicago, in a recent talk before a society of engineers, spoke of the requirements necessary for a mechanical engineer to become proficient in his profession. He illustrated his remarks by the story of a young man who had embarked in the plumbing business through sheer nerve. Here are his own words:

As to the qualifications for such a position, I think too many of them have qualified—and evidence of this has been shown in the correspondence which has been received by this Efficiency Society—in a similar manner to a young man who grew up in my town. He was a lad in knee trousers when I left home, an ingenious lad, belonging to an ingenious family. He never stuck to anything very long, but he was ingenious enough to pick up almost anything and make a fair attempt at doing it, though he never did it very thoroughly or efficiently. The lad, as I say, was in knee trousers when I left home. Some years afterwards I was living in St. Paul and was at that time mechanical engineer of a steam railway. This lad came into my office to see me—a fine looking fellow, dressed well, and apparently very prosperous. I said to him, "James," (his name was not James) "you seem to be doing well."

"Yes, sir, finely."

"And what are you doing now, James?"

"Oh," he said, "I am a plumber."

I said, "How did you happen to get to be a plumber?"

"Well," he said, "it was this way, B. J. I went out to ——— a couple of years ago and looked around, and I saw only two plumbers' shops in the town, and I thought it was a good place to start a plumbing shop, and said to myself, by gosh, I'm a plumber, and I rented a vacant store and have been a plumber there ever since."

While his ambition was good, his execution was poor, and in order to make the anecdote teach a useful lesson, I am compelled to say that he went into bankruptcy two years afterwards. He, however, learned his lesson and is today an efficient and successful traveling salesman for one of the large plumbing establishments of the country.

The story illustrates in one way some of the difficulties that the plumbing business of today, as well as the heating and ventilating lines, which are up against the same conditions, encounters, particularly in the smaller towns. The fact that it is not difficult to get into the business, has made it a temptation to many young fellows who are not fully equipped ped by previous training to buy and sell as well as to produce plumbing and heating work.

There are so many angles to the business that are not covered by an examination of the master plumber and the training that master fitters must have that it is at times a wonder to other business men how the business remains as stable as it is.

Yet there is a rift in the clouds and it is impossible to look over the field without noting the vast improvements in the methods of the trade and the work they are doing, even within such a short period as a year's time.

Mr. Arnold's definition of an efficiency engineer might well fit the craft in this case. There is no question but what the master plumber and steam fitter is coming to be looked upon as an efficiency engineer in his own community. "A prophet is no without honor except in his own country," and the master plumber and fitter who is striving for the uplift of the craft, has been up against this adage for years. The expert from outside is the prophet—the man whose every-day work is seen by all, is taken for granted.

Heating and Ventilating a Church Building

The New St. Patrick's Church, of Philadelphia, Has Provided the Opportunity for an Up-to-Date Ventilating Equipment

By JOSEPH GRAHAM

THE heating and ventilating system installed in St. Patrick's Church, Philadelphia, is laid out with a great deal of care, which has resulted in an equitable temperature in the church, the elimination of draughts and a permanent fresh atmosphere at all times.

Heating.

The boilers installed are two 48 inch 14 section cast iron steam boilers, each having 780 square feet of fire surface and 24 square feet of grate surface.

The pipe systems are arranged so as to secure the return of the water of condensation to the boilers by gravity. The horizontal return mains are run below the water level of the boilers, so as to obtain a sealed return for the branches from risers; any dry returns and branches at ceiling or in trenches are run separately to a point below the water level.

Relief pipes are provided at the foot of each rising line and on the horizontal mains, connecting with the return pipes.

Branches from risers, etc., are provided with valves on the supply, return and relief connections in the boiler room. The building is heated by direct radiation.

Radiator connections from risers are run under the finished floor, except the connections for the radiators in the chapel connecting with the exposed mains and such radiator connections as are run in the arches of the Gustavino construction. Radiator connections underneath concrete, mosaic or similar floors are run in trenches.

The connections from the steam and return valves to the radiators are made with nipples.

Valves 2½ inches in diameter and less are steam metal with finished trimmings.

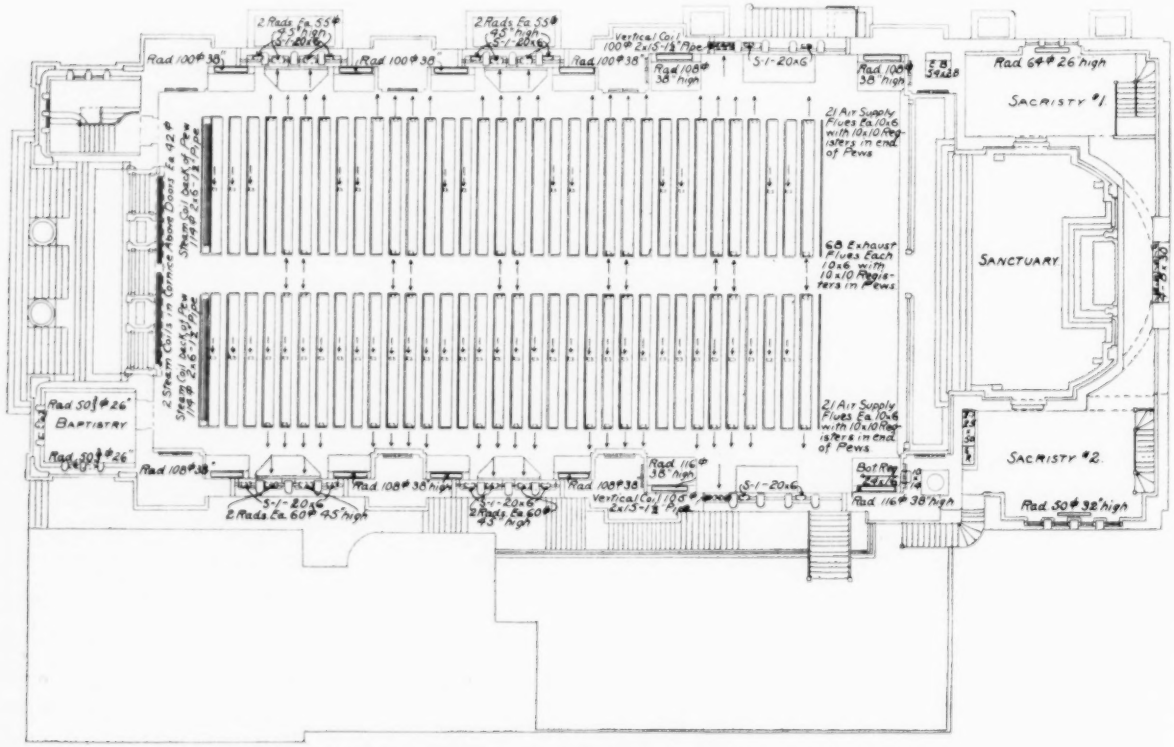
Valves larger than 2½ inches in diameter have iron bodies and steam metal trimmings. Valves on radiators and coils, and all other valves not covered with non-conducting material have polished trimmings.

The radiators are provided with automatic air valves; dry connections being provided for each air valve, which all connect with main dry line which is trapped with sewer and vented to the atmosphere.

Ventilation.

The ventilating system is clearly shown on the plans and consists of fresh air supply for the church and the chapel by means of a centrifugal fan located in the basement, in connection with a tempering coil to heat the fresh air supply to the proper degree. It also provides for exhaust for the above rooms by means of a disc fan located in the roof space.

The centrifugal fan installed has a blast wheel 6 feet 6 inches in diameter by 3 feet 6 inches wide, and is en-


Rad 100# 38"
2 Rads Ea 55# 45" high
Vertical Coil 100# 2x15-1½ Pipe
5-1-20x6
Rad 108# 38" high
Rad 100# 38" high
S.B. 34x28
Rad 64# 26" high
SACRISTY #1
21 Air Supply Flues Ea 10x6 with 10x10 Registers in end of Pews
68 Exhaust Flues Each 10x6 with 10x10 Registers in Pews
SANCTUARY
Steam Coil in Cornice Above Doors Ea 42# 1¼# 2x6-1½ Pipe
Steam Coil Back of Pew 1¼# 2x6-1½ Pipe
Rad 50# 26"
BAPTISTRY
Rad 50# 26"
Rad 108# 38"
Rad 108# 38" high
2 Rads Ea 60# 45" high
Rad 116# 38" high
Bot Reg 24x12
Rad 116# 38" high
SACRISTY #2
Rad 50# 32" high

First Floor Plan Showing **Heating and Ventilating**, St. Patrick's Church, Philadelphia.

closed in a steel plate housing, designed with special inlets and outlets to meet the space conditions. The fan is connected with a "C&C" electric motor by means of a flexible flange coupling. The motor is capable of developing 9 horsepower at a maximum speed of 180 revolutions per minute. The fan and motor are placed on foundations of hard burnt brick laid in cement motar.

In connection with the fan there is erected a set of mitre type tempering coils having 914 square feet of heating surface made up of 7 two-row sections 6 feet by 6 inches wide by 5 feet high making the coils 14 rows deep.

The sections are made up of one-inch pipe screwed into separate cast iron headers on steam and return ends and arranged to secure positive circulation of steam. The headers are 6 inches wide.

The tempering coil is encased in a jacket of steel plate, No. 10 gauge, extending from the fresh air filter chamber to and connecting with the inlets of the blower.

The fan, tempering coil and casings, etc., were furnished by the B. F. Sturtevant Co.

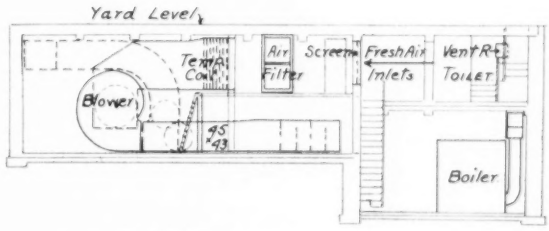
The air filters, which are built into the fresh air chamber, consist of wooden frames of convenient size with galvanized iron netting with cheese cloth, having a total filter area of 675 square feet. The wooden frames are supported by frame work of galvanized iron fastened to the floor and ceiling of the fresh air chamber, so as to resist the air pressure.

The exhaust fan is a 60-inch diameter Howard & Morse "Blackman" disc fan with circular frame and arranged for direct connected electric motor. The fan and its motor are supported upon a special foundation frame consisting of 6-inch thick plank frame set on two layers of compressed cork, each 2 inches thick, fastened to the building construction in such a manner as to prevent the transmission of sound and vibration.

The motor driving the 60-inch disc fan is capable of developing 7 horsepower at a maximum speed of 300 revolutions per minute.

The motors are "C&C" furnished by the Garwood Electric Co. They are especially built for the purpose, being designed for field control and provided with field control devices.

The manner of running the galvanized iron ducts, flues,



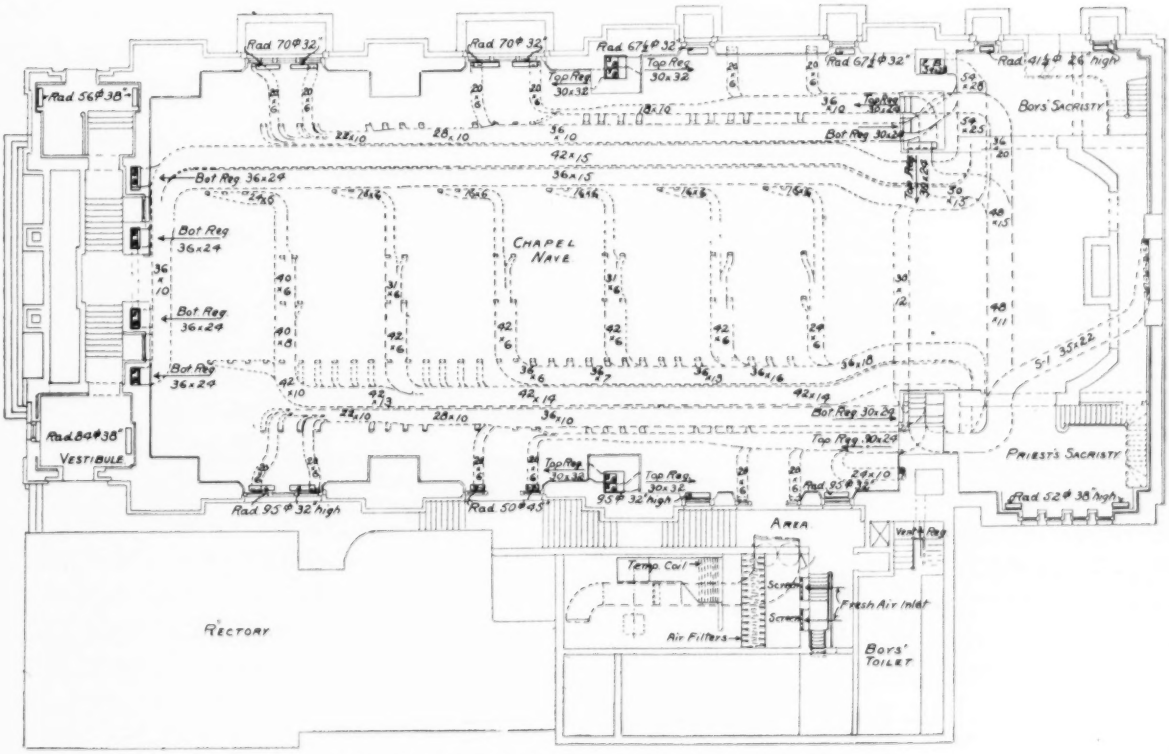
Section Through Blower Room and Boiler Room.

shafts, etc., is clearly shown on the plans, and consists of:

A system of tempered air ducts and flues connecting the outlet of the centrifugal fan with the air supply registers in the church and with the recesses below the church windows.

A system of tempered air ducts and flues connecting the main air supply duct with the air supply registers in the chapel.

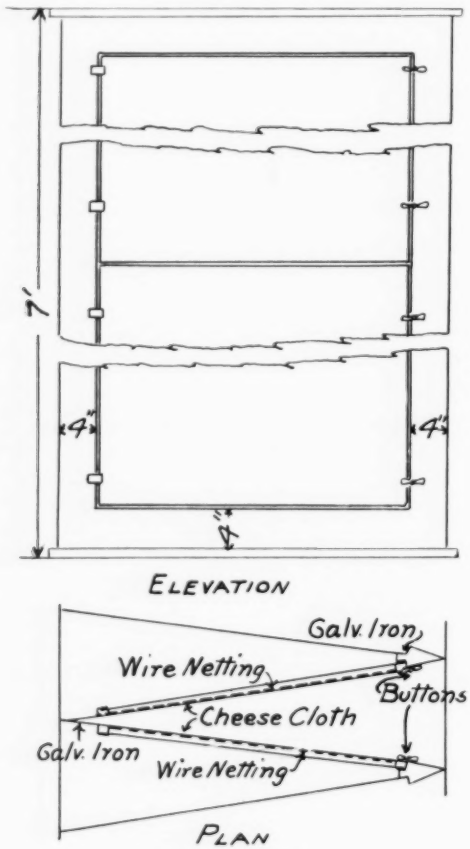
A system of flues and ducts connecting the exhaust registers in the church and the chapel with the exhaust fan in the roof space.



Basement Plan, Showing Radiators and Ducts.

The ducts, flues, etc., are built of the best bloom galvanized iron of the following gauges:

Ducts and flues having one dimension of 48 inches and over are No. 20 gauge, braced with angle iron.



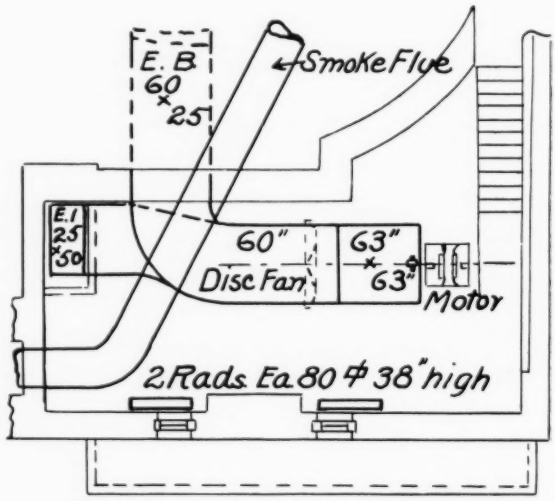
Details of Air Filters.

Thirty inches and over No. 20 gauge.
Twelve inches and over No. 22 gauge.
Smaller ducts are No. 24 gauge.
The ducts are suspended with galvanized iron hangers.

They are designed with curves and bends so as to effect an easy flow of air, the inside radius of curves on ducts and flues being equal to the width of same.

The fresh air inlet opening is provided with a wire screen door, made up of No. 14 gauge copper wire on an iron frame.

Adjustable slide dampers are provided back of air supply registers located in the ends of the pews; dampers with quadrants indicating their position are provided in the duct connections leading to and from the individual

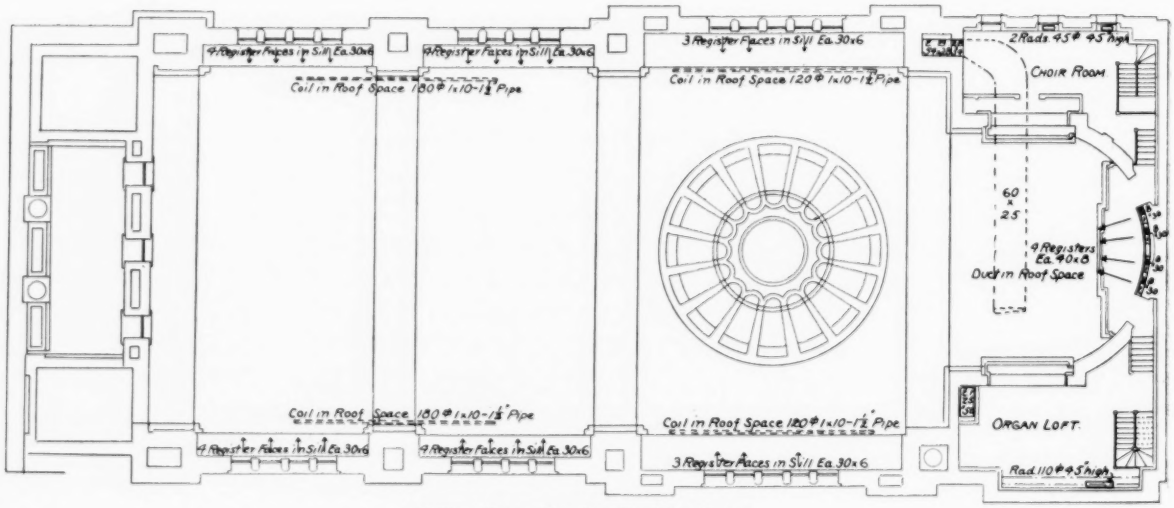


Plan of Fan Room Above Organ Loft.

supply and exhaust flues and branches, except in those run in the Gustavino construction, which cannot be reached. Deflectors for permanent adjustment and slide doors for access to dampers and deflectors are also provided where necessary.

Steel plate double dampers are placed in the main fresh tempered air supply ducts leading to the church and chapel and in the main ducts from the church and chapel exhaust systems.

These dampers are connected together in such a manner that the damper in the church system duct will be opened with the same motion which closes the damper in the

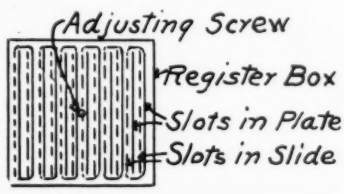

4 Register Faces in Sill Ea. 30x6
4 Register Faces in Sill Ea. 30x6
Coil in Roof Space 180 # 1x10-1½ Pipe
3 Register Faces in Sill Ea. 30x6
Coil in Roof Space 120 # 1x10-1½ Pipe
2 Rads 45 # 45 high
CHOIR ROOM
60
x
25
4 Registers Ea. 40x8
Duct in Roof Space
Coil in Roof Space 180 # 1x10-1½ Pipe
4 Register Faces in Sill Ea. 30x6
4 Register Faces in Sill Ea. 30x6
Coil in Roof Space 120 # 1x10-1½ Pipe
3 Register Faces in Sill Ea. 30x6
ORGAN LOFT
Rad. 110 # 45 high

Ceiling Plan, Showing Register Faces.

chapel system duct and vice versa. The dampers are set in iron frames and provided with operating and fastening devices, so arranged that the dampers can be set and securely held in any desired position.

A No. 20 gauge galvanized iron air discharge duct is extended from the exhaust fan in the roof space, starting at the fan and terminating with a protection hood of No. 20 gauge galvanized iron.

The protecting hood located below the roof is specially constructed and provided with a 24-ounce copper extension and a 24-ounce copper gutter, having soldered and water-tight joints.



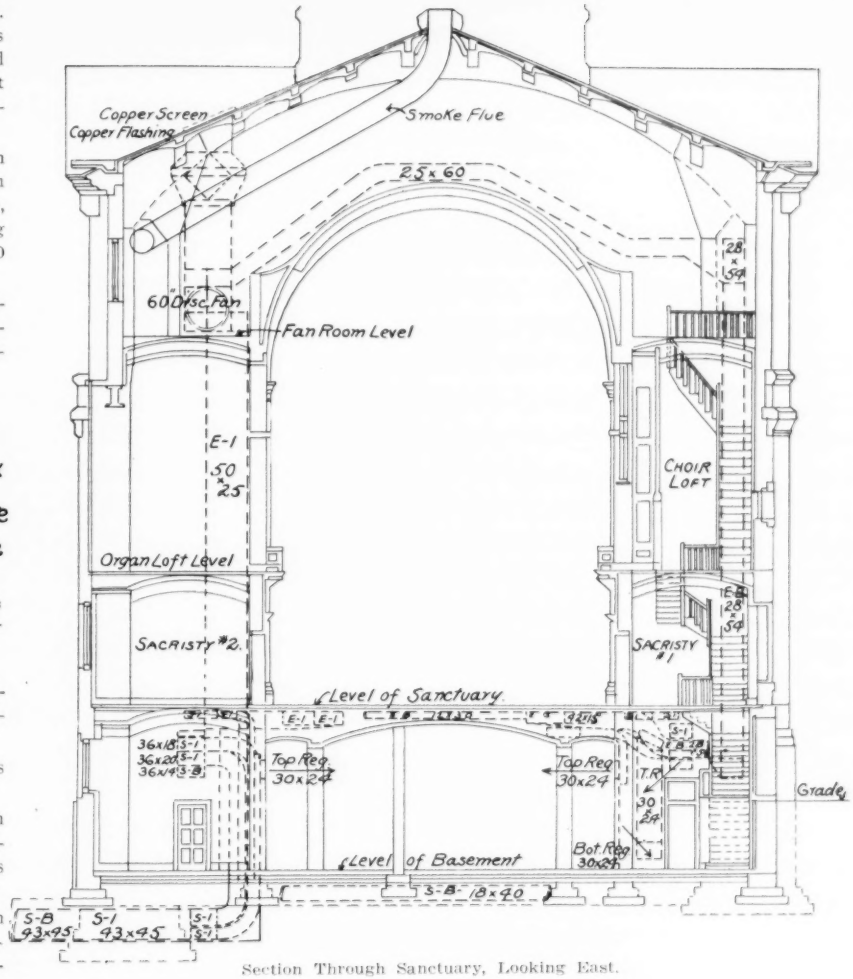
Detail of Adjustable Slide Dampers Back of all Registers Where Dampers are not Accessible.

The registers and register faces are Tuttle & Bailey make.

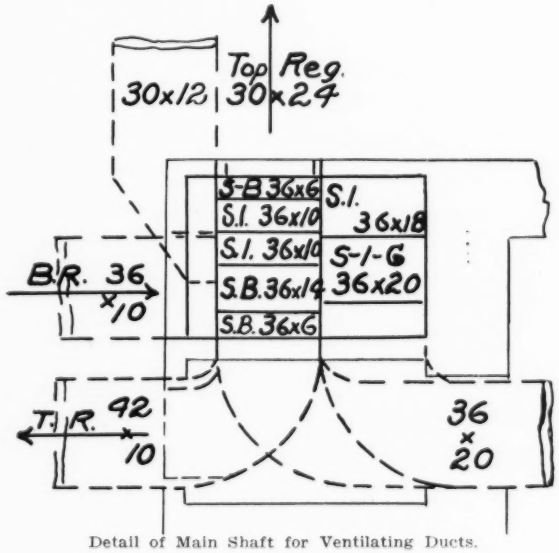
The temperature of the church is controlled by the Johnson system, there being 43 heat sources controlled by 15 thermostats.

The direct heating surfaces in the room are controlled by diaphragm valves on steam and return ends of radiators, coils, etc.

The coils over the entrance and the radiators in the recesses below the church windows are controlled by a cold air thermostat exposed to the atmosphere, automatically shutting off the diaphragm valves on the steam and return pipes when the external air temperature rises to a certain degree, and again opening the valves when the temperature drops below this degree thus securing a continuous heating effect for the purpose of counteracting down draft in the coldest weather.



Section Through Sanctuary, Looking East.



Detail of Main Shaft for Ventilating Ducts.

The four inside sections of the tempering coils are controlled by a hot air thermostat, located in the tempered air duct, automatically operating the diaphragm valves on the steam and return pipes as required to maintain the temperature of the air in the duct at the desired degree.

The three outside sections of the tempering coils are controlled by a cold air thermostat, located in the fresh air inlet, automatically shutting off the diaphragm valves on steam and return pipes when the incoming air rises to a certain degree and opening the valves when the fresh air temperature drops below this degree, thus securing a continuous heating effect from these sections when required.

Covering.

The steam, return, relief and blow-off pipes, except the steam and return lines run exposed at the chapel floor, are covered with one standard thickness of magnesia sectional covering, canvas jacketed.

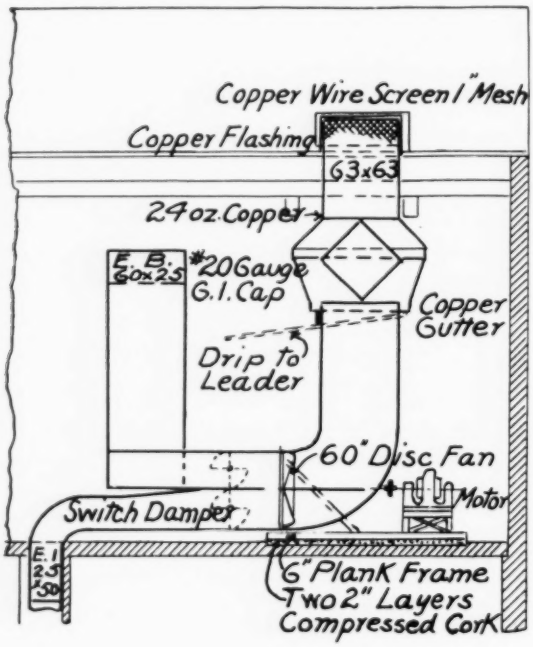
Fittings and valves on these pipes, except valves on

radiators and coils, are covered with magnesia asbestos cement of the same thickness as the covering of the pipes.

The non-conducting covering on all exposed pipe work is encased with an extra covering canvas.

The blower housing and the tempering coil casing and its connections from the blower to the filter room are covered with 1-inch thick magnesia asbestos blocks wired on, cemented and encased in canvas.

The tempered air ducts in the basement from the outlet of the blower to a level 15 feet above the basement floor, except distributing ducts in the arches of the Gustavino construction, are covered with asbestos air cell covering



Section Through Fan Room.

wired on and cemented. This covering is ¾ inch thick and on the exposed parts of the main ducts in the basement is encased with canvas.

The church was designed by La Farge & Morris, architects, New York. The consulting engineers for the heating and ventilating work were Nygren, Tenney & Ohmes, New York, John P. Smith & Co., Philadelphia, was the heating contractor.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect Oscar Wenderoth, Treasury Department, Washington, D. C., will receive sealed proposals for government work as follows:

Until 3 p. m., December 20, 1913, for a new plumbing system and interior lighting fixtures in the United States custom house at St. Louis, Mo.

Until 3 p. m., December 27, 1913, for the construction, including plumbing, heating and lighting systems, of a two-story and basement building, with a ground area of 4,200 square feet, for the United States post office at Macomb, Ill.

Drawings and specifications may be obtained from the custodians of the different sites, or at the office of the Supervising Architect in Washington, D. C.

Humor.

A great philosopher has said that humor is the spice of life. I don't recall who the chap was who made this remark, but at any rate he hit the nail on the head with a bing and a zing. Humor dispels sadness—it is a sure cure for the blues, pessimism and the grouch. Even a chronic crank can be made to crack a smile if you shoot a sharp and keen-edged joke into him.

Well sir, about a year ago I was traveling in the East. It was during my annual vacation. I take one every year. You bet your sweet life, I do. It's an investment in health and energy, you know. I stopped off and visited during my trip, with some cousins of mine living in a pretty and lively little city. While there I heard of the existence of a Master Plumbers' Pleasure Club in the town. There were about twelve members. I received an invitation to attend one of their good fellowship gatherings. On the night of my presence the club was having a "Jokers' and Smokers' Evening," and everybody was requested to tell some good jokes. The club formed in a circle with the president in the center.

Master Plumber Mr. A.:—"Two Irishmen were to be hung for cattle-stealing in a wild and woolly western section of the country. The mob of cowboys led the culprits to a high bridge. They placed the rope around Pat's neck—and then pushed him off—he dropped all right and he kept on dropping but the knot slipped loose. Pat dropped into the river below, and he at once swam ashore and made his escape. When they were putting the rope around Mike's neck, he exclaimed earnestly—'Be sure and tie that rope tight round me neck, because divil-a-bit I can't swim.'"

Master Plumber Mr. B.:—"An Englishman went into a restaurant upon arriving in this country. The waiter served him with soup as a regular part of the dinner. 'I say, old top,' remarked the Englishman, 'what is that you're giving me?' 'It's bean soup, sir,' replied the waiter. 'I don't care a hang what it's been,' snapped the Englishman. 'I want to know what it is.'"

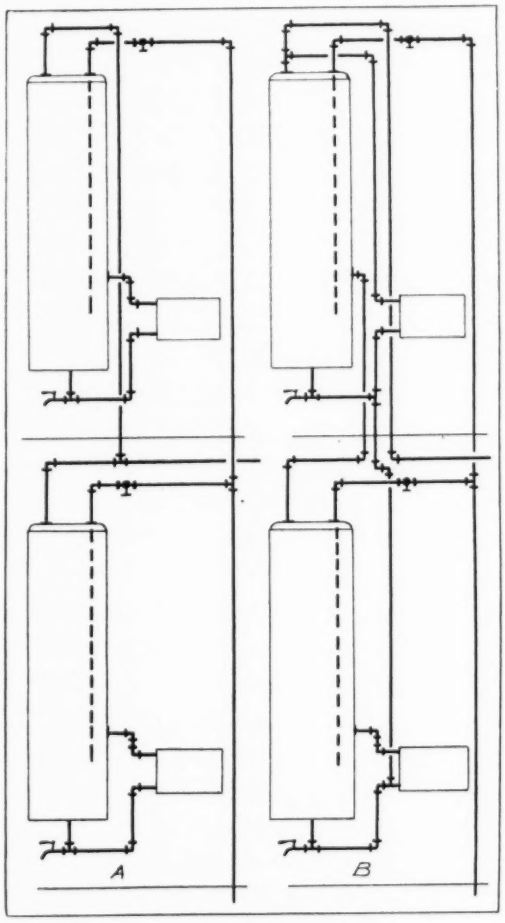
Master Plumber Mr. C.:—'A big, raw-boned Swede, Ole Olson by name, fresh from the backwoods of Minnesota, arrived in St. Paul one Sabbath morning. He was looking around for a Swedish church, but not being able to locate one, he went into an American place of worship. He couldn't understand much English, and about the only thing that appealed to him was the singing and the music. At the close of the service the choir arose and sang "Holy, Holy, Holy." The Swede jumped to his feet and shouted—'My name bane Ole, Vat skäll you have me do?'"

Master Plumber Mr. D.:—"A Jewish boy and an Irish boy were fighting on the street one day. The scrap took place near the Jewish boy's home. The Hebrew lad fought vigorously with his fists, but he didn't move his right foot one fraction of an inch. The Jewish boy's father happened to look out of the window of his house and he noticed his son being rather severely pummelled. He opened the window—'Say Isaac? Vhy don't you run? Vhy do you let that little Irish loafer lick you?' 'I can't run Pa! I can't run!' cried the Jewish boy. 'I got my foot on a nickel.'"

Questions and Answers

TWO BOILERS HEATED BY TWO RANGES.

Editor "Domestic Engineering":—I am sending you a sketch of a hot water supply system that I recently installed. Two boilers on two different floors are heated by two ranges, and both supply one line of pipe to fixtures. When either of the two boilers is working alone



Two Boilers Heated by Two Range Stoves.

the results are good, but when they are both working the supply is poor. Please show me my trouble.

Lafayette, Ind. X.

In our illustration, A shows the connections which are causing "X" trouble and B shows certain changes which we think will improve the work and remove the trouble that now exists.

In X's connections the flow from the upper boiler is carried down and into the flow from the lower boiler. The manner in which this is done is wrong. When both boilers are working, the flow of hot water from the lower boiler will naturally be upward, with the result that it will hold back the flow from the upper boiler. In other words, the flow from the two boilers will be opposite in direction, and opposed to each other.

This feature we have remedied in B, by connecting the upper range to the top of its boiler, and connecting the flow from the lower boiler into the side of the upper boiler. The hot water supply to fixtures is then taken from the top of the upper boiler, and delivered wherever called for.

Another point of criticism concerning A is the fact that the returns from the two boilers to their water fronts are independent. Experience shows that when two such returns are connected together, the boilers work together more evenly and more satisfactorily, owing to the fact that each is then working under exactly the same conditions.

The connections of B show the returns tied together in this way.

With the changes that B shows, we believe there should be no further trouble with this job.

DRAINAGE FOR HORSE STALLS.

Editor "Domestic Engineering":—We expect to have to put in two horse-stall drains, and as we are not acquâinted with this work, we write you for information on such work, as to connections, etc.

Brooklyn, N. Y. J. & M.

In installing horse-stall drains, a special sink, made for this work, is used.

In Fig. 1 we show two views of such a sink, which

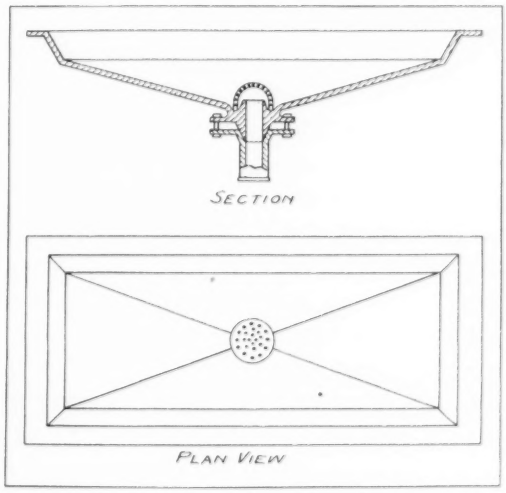


Fig. 1.

show that it is so constructed that everything falling into it flows from all four sides toward the center. Over the outlet there is a perforated strainer which prevents solid matter from going through into the drain. The spigot end caulks into the cast iron drainage pipe, and bolts to the main part of the sink.

In Fig. 2 we show the connections for the stall sink.

It should be set toward the rear of the stall, at such a point as to best receive the drainage that enters it.

Covering the area of the sink there should be a trap door which may be swung back to allow the sink to be reached for cleaning purposes. This trap door should

be made of narrow planking laid with sufficient open spaces to allow liquids to pass through to the sink.

One trap will answer for the two stall sinks, and it should have two cleanouts, with a third cleanout at the end of the horizontal line, as the nature of the waste

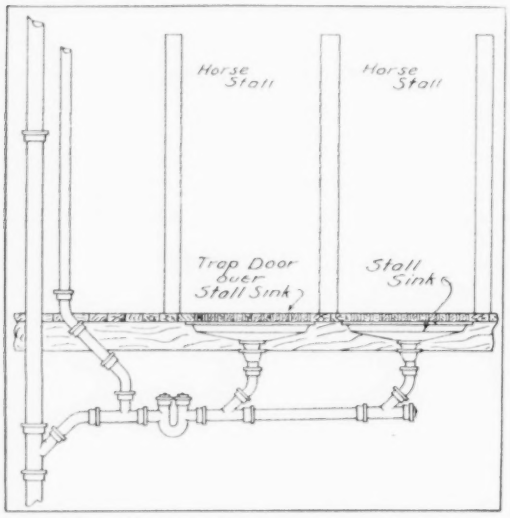


Fig. 2.

is such that ample provision must be made for cleaning. The connections for these sinks are 2 inch.

It would not be advisable to allow one trap to serve more than two stalls, as this would necessitate a long line of foul waste pipe.

ROUGHING-IN JOB APPEARS SATISFACTORY.

Editor "Domestic Engineering":—We have just roughed-in the plumbing in a double house, making closet

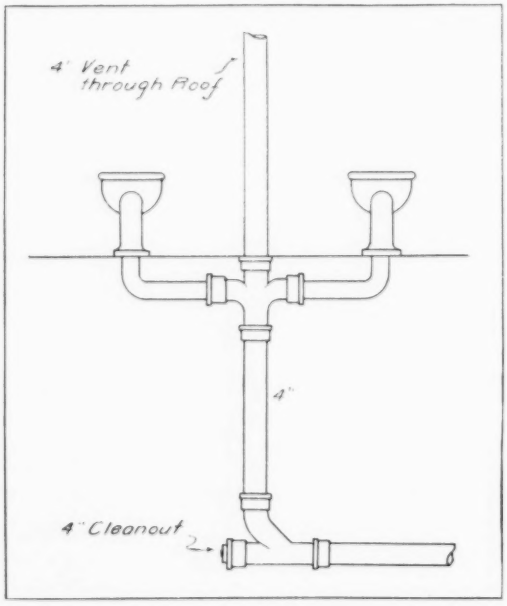


Fig. 1.

connections as shown in the accompanying drawing, Fig. 1. You will note the double fitting is a sanitary tee, a lead bend being caulked in on both sides, and the closets are of the low-down syphon-action type. We are told that this job is not installed in a sanitary manner or in accordance with the best sanitary practice. What is wrong? Can you find any fault with this method of installation?

Missouri. M. K. D.

We show in our illustration the work that correspondent has submitted.

Our judgment would be that the job, as shown, is properly installed, provided that no fixtures enter this stack above the two water closets.

No criticism is made of the use of a circuit vent to vent a line of water closets, and, as far as we can see, these two fixtures are as well vented as they would be by means of a circuit vent.

We appreciate the point however, that if the city plumbing ordinance called for the use of some practice differing from the one here used, the city plumbing inspection department would be justified in enforcing such a requirement.

VALUE OF SPECIAL CONTINUOUS VENT FITTINGS.

Editor "Domestic Engineering":—Please inform me what advantages are claimed for the various special drainage and vent fittings now in use.

Victoria, B. C. L. M. N.

We presume the fittings that "L. M. N." has reference to are those fittings which have been brought out by the introduction of continuous venting.

Such fittings, of course, bring the advantages that come

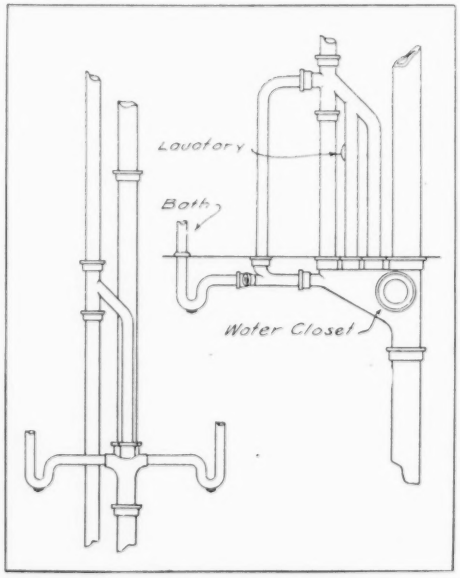


Fig. 1.

from the use of continuous vents. Continuous vents constructed with ordinary fittings are in much less danger of stoppage than crown vents, and when these special fittings are used this danger is generally still further reduced, as they call for many less joints, with consequent less opportunity for stoppage, and for the reason that these fittings

are specially constructed with the avoidance of this danger in view.

Being designed for special locations and conditions,

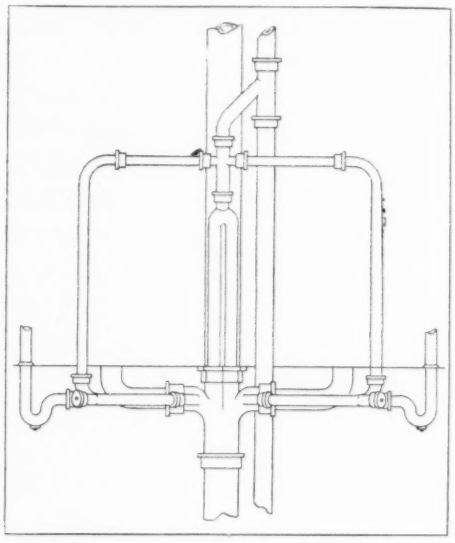


Fig. 2.

these fittings make the construction of sanitary work much easier, and they take up less room and make the work more compact. By their employment it is often an

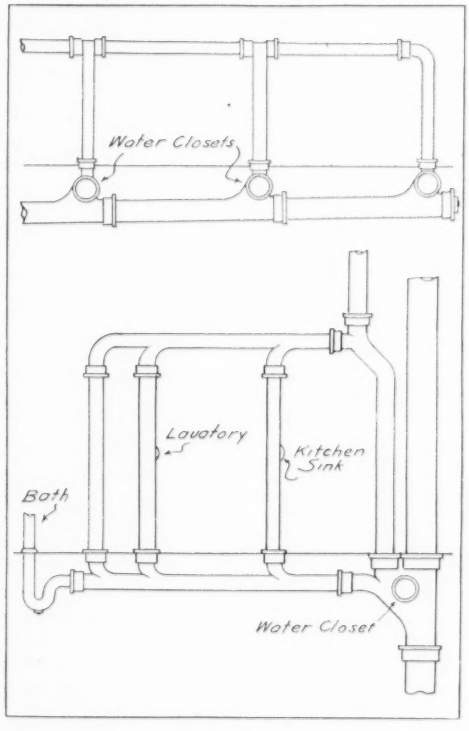


Fig. 3.

easy matter to install connections that would be very difficult and sometimes impossible to put in with common fittings. They often effect a saving in the cost of construction, both in material and in labor. They also allow the plumbing system to be much further advanced when the water test is made, than is possible with the use of common fittings.

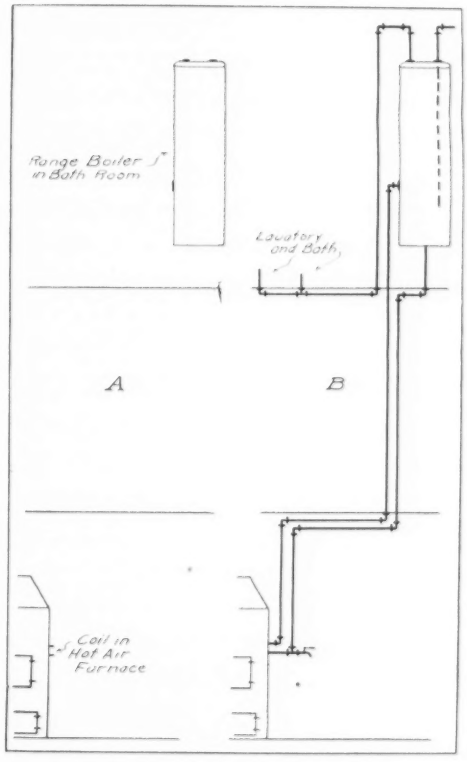
In the three accompanying illustrations, we show typical fittings of this general type, which will doubtless show clearly the truth of our remarks concerning their value.

BATH ROOM HEATED BY RANGE BOILER.

Editor "Domestic Engineering":—Enclosed you will find a rough sketch of a proposed plant, which is to heat the water for the bath room, and the range boiler should also keep the room warm enough to prevent freezing. It is a small room. Can this be done? If so, we would like to have you publish a sketch or outline showing the run of the piping, the connections, etc.

St. Louis, Mo. M. & H.

In "A" of our illustration, we show correspondent's



Bath Room Heated By Range Boiler.

problem, and in "B" the connections that we would advise.

We do not know whether the system is under direct or tank pressure, or what the pressure is. If the pressure is low, there may be some difficulty from accumulation of air in the hot water supply to fixtures, at the high point above the boiler. If it is a tank system, the expansion pipe from the high point to the tank would relieve the air.

With the boiler well heated, we believe the heat radiated from it will properly heat the bath room, especially as the room is a small one.

Business Methods for the Plumber and Fitter

VI.—The Contracts—Their Significance and the Desirability of Written Agreements—Making Copies of All Correspondence

By WESLEY A. FINK

WRITTEN contracts are more reliable than oral, and are not as subject to mistake, imposition and falsehood. All contracts of any consequence should be in writing, as in law certain contracts cannot be enforced unless written evidence of the terms of the agreement and of the parties to it is produced.

A contract is an agreement between two parties, resulting in an obligation or legal tie, by reason of which one party is entitled to have certain stipulated acts performed or forborne by the other. In general, the agreement or assent of the parties must be a mutual willingness to enter upon and be bound by an understood bargain. There is no contract unless the parties so assent to the same thing and in the same sense. If a contract is reduced in detail to writing the terms are known to each of the contracting parties; and by a rule of evidence in law, when the words of a contract are in writing and definite, oral testimony will not be admitted to contravene or vary them.

When you submit an estimate make it out on a duplicate contract form as in Fig. 1, specifying what work you propose to do, amount of contract, and terms of payment, so that there will be no msiunderstanding as to what you propose to do. Be sure to fill in the terms of payment, such an amount when the job is roughed-in, so much as soon as the material is on the ground, balance within so many days after the work is completed. As you have to guarantee that the work will be completed satisfactorily, you should have some guarantee as to the payments to be made. It puts you in a position then to meet your bills promptly and finance your pay roll. When the payments on a contract becomes due send in your order promptly, or the owner or contractor may stand you off and pay some other creditor who is more pressing.

If the customer accepts your estimate, get him to sign one of these contract blanks. If desired, these contract blanks can be printed on your regular letterheads, allowing sufficient blank space for filling in details.

Specifications and Contract.

To .....

.....

We herewith submit specifications and bid for

.....

We guarantee all material used in this contract to be first-class. The entire job to be done in a neat, substantial manner and guaranteed as such for one year.

Any alteration or deviation from the plans herein agreed upon involving extra cost of labor and material, will be executed upon written orders for same, and will become an extra charge over the sum mentioned in this contract.

We hereby propose to furnish and erect the above complete in accordance with the above specifications for the sum of.....

..... Dollars ($.....).

Payment to be made as follows:.....

.....

Date .....

The foregoing terms, specifications and conditions are satisfactory, and the same are hereby accepted and agreed upon, and.....hereby authorize you to execute the same.

.....

.....

Date.....

Contracts made with our mechanics not recignized.

This contract is void after 30 days from date, unless signed.

Fig. 1. Contract Form, size 8½x11.

Letter Copy Books and Files.

Copies of all letters or estimates sent out should be retained for future reference. The old method was to write the letters by pen or typewriter, and then copies were made in a letter copying book by the use of the old-fashioned screw letter press and a damp blotter or cloth. This letter book was then indexed for ready reference.

Since the advent of the vertical file and the more general use of the typewriter, better methods have been adopted. One method is to have all letters typewritten and a carbon copy made at the same time while writing. The objections to this method are that any corrections made on the original do not always show on the carbon copy, and also the carbon copy does not contain the signature of the party signing the original letter, although this can be overcome if care is taken to see that all corrections on the original letter are also made on the carbon copy, and by the writer signing both the original and carbon copies.

Another method is to have the original letter tyewritten, and after all corrections are made and the letter signed, copies of the letter are made on a "roller press copier," which insures copying everything that ought to be copied, giving it a legal standing; every correction made at the time of signing appearing on the copies, and also locating the responsibility for signatures. The copies are made on a continuous sheet of tissue paper, which, when removed from the reel of the roller copier, are cut into proper lengths, each letter copy on a separate sheet by itself, and then filed away.

In either the carbon copy system or the roller copier system, the loose sheet copies of the letters are filed away in vertical files. A folder is used for each regular customer or correspondent, and in this folder is filed all of the correspondence received and the copies of all letters sent to that particular customer. The advantage of the vertical file is that you have all of the correspondence to or from any particular customer over a long period all in one folder convenient for quick reference. No searching from page to page of from one letter copy book to another, as was necessary in the old-fashioned screw letter

press copy book. Only one possible place to put any letter and only that one place to look for it, now or five years hence. One drawer of a vertical file usually furnishes sufficient capacity for the ordinary correspondence of a small business or a jobbing plumber.

Cost Price Record.

It is necessary to have some sort of a price record conveniently at hand, so that one can find any price required without loss of time. Of course, a business man always has access to his correspondence files containing letters of quotations, and presumably has within easy reach a complete line of catalogs and discount sheets, covering all lines of goods used by his concern, but in these days this is too slow, and not at all times convenient.

With the card index system, little trouble will be experienced in arranging price records, which are easily accessible as well as reliable, and because of their fluctuating character, flexible devices must be used. It is best to arrange the price record cards indexed by articles rather than the names of the firms making the quotations. A card should be headed with the name of the article, as in Fig. 2, showing the names of the different firms, quoting, with date of quotation, prices or discounts, etc.

Soil Pipe.		Date	Price or Discount
John Doe Co.	S. H.	4-29-12	16c
" " "	D. H.	"	17c
Richard Roe	S. H.	5-4-12	16½c
" "	D. H.	"	17½c

Fig. 2. Price Record Card.

These cards are filed in an alphabetical index according to the name of the article or according to certain classes of materials or supplies, as "wash trays," "wash tray fittings and connections," would be filed after W behind a sub-guide labeled "Wash Trays and Connections," and would be subdivided again into "All Porcelain Wash Trays," "Enameled Iron Wash Trays," "Soapstone Wash Trays," "Cement Wash Trays," "Wash Tray Connections," etc.

As new quotations, discounts or prices are received they are entered on the proper card, both sides of the card being used if necessary. Also new prices from invoices can be copied on these cards for reference. The advantage of such a system can scarcely be over-estimated. For making up estimates one has a ready reference of all prices at hand. If a traveling salesman calls and quotes a price on a certain line of goods, the master plumber has but to open the drawer of his desk, where he has in his card index price file a record entered of all quotations which he has received from other houses. He can also make at the same time on his price card a record of the quotations given by the salesman, instead of simply making a memorandum and filing this in a pigeonhole of his desk, where it is soon forgotten. Also when an invoice is received for a bill of goods, he can compare and check the prices with the last quotations, and any overcharges may be quickly detected.

The buyer who knows is the one who obtains the lowest quotation, for the dealer is quick to appreciate that fact when prices are being compared and checked, and when overcharges are brought to his attention is more careful to give his lowest competitive prices and best discounts.

(To be continued.)

He Hadn't Met the Preacher.

There have been stories told about the church-going habits of master plumbers before this, that have been made out of whole cloth. But here's a true one that happened within the last month.

The meeting of the synod of the Presbyterian Church was scheduled to take place in a certain Illinois city. As is customary in such cases, the visiting ministers were assigned to the homes of church members to be entertained during their stay.

The wife of a well-known master plumber of that city, who was also on the church roll as a member, volunteered to look after the physical well-being of two of the reverend gentlemen during their stay.

The clergymen arrived on an evening train and were duly welcomed. The next morning the master plumber voluteered to escort them to the church, where they were to register. The minister of the local church was a comparatively new man, having taken charge some six months before, following the resignation of a clergyman who had occupied the pulpit for nearly a quarter of a century.

The master plumber and his two guests left the house bright and early and repaired to the study of the church.

"Good morning, Dr. Jenney," said Mr. Plumber to the gentleman whom he found in the study. "Here are two gentlemen who have been assigned to my home. I hope you will make them welcome to our fair city." And then he left.

It was not until the next day that he learned that the supposedly reverend gentleman in the study, whom he supposed was his pastor, was really the janitor in his "Sunday-go-to-meeting" garb. Some of the boys have been spreading the story with unusual interest, to the discomfort of the master plumber himself, not to say his embarrassment.

MASTER PLUMBERS ENJOY LECTURE ON GAS WATER HEATERS.

Members and guests of the North Shore Association of Master Plumbers of Massachusetts to the number of thirty-five gathered in the Board of Trade rooms at Salem, Mass., one night last week and listened to an interesting illustrated lecture on gas water heaters. The speaker was E. S. Stack, of the Somerville Manufacturing Co., an inventor. He explained the several types of water heaters and spoke of the problems connected with their installation and of their increased use by gas companies and plumbers. He had thrown on the screen pictures showing perfect and imperfect installations, pointing out the defects where such existed. Plumbers from Salem, Beverly, Peabody, Hamilton and elsewhere along the North Shore were present, and the guests included managers of the several gas light plants in the district and David Craig, past-president of the National Association of Master Plumbers. The lecture was followed by a collation. The lecture was one of a series of such talks which have been arranged by the association for educational purposes. Another is to be given at the December meeting.

The Disposal of Sewage Sludge

Some of the Advanced Methods Used in Germany, by Karl Imhoff
Chief Engineer, Sewer Department Emscher Genossenschaft, Essen

SLUDGE results from all methods of treating sewage. The problem of handling this sludge satisfactory is just as important as the treatment of the sewage itself, for experience has shown that sludge which has been poorly handled is much more objectionable than the worst sewage.

Wet Sludge.

Fresh wet sludge contains ordinarily more than 90 per cent water and can be pumped out of the settling tanks in the same way as sewage or water. It would therefore seem a simple matter to get rid of it by pumping it on to low-lying ground and allowing it to remain there with the hope that it would in time become firm. Such treatment is unfortunately almost always without success. Sludge deposited in deep layers does not dry, and the ground remains wet. This treatment is, therefore, useful only when the sludge is spread out in very thin layers. The sludge can also be discharged into shallow trenches. Under these conditions the sludge dries in some weeks, and can be ploughed into the ground for agricultural purposes. The sludge thus becomes used, as it were, for irrigation, just as with sewage. There is the disadvantage, however, that a large area is necessary, and that objectionable odors cannot be prevented. In the case of cities located near the ocean, the problem becomes simpler. Such cities can send their sludge in ships out to sea and allow it to sink. Since it becomes necessary to carry the sludge a considerable distance from the shore, the cost of this method of disposal is quite high, and it is very probable that some of the cities which have been using this method of sludge disposal could now accomplish the desired ends cheaper by adopting another method of disposal. In general, one can say with assurance that the cases are very few where it is desirable to dispose of sludge in a wet condition.

Dry Sludge.

As soon as sludge has been properly dried, it has lost most of its objectionable characteristics. In any case, dry sludge can be used as easily for agricultural purposes as other kinds of fertilizer. Its value, however, for agricultural purposes depends more on its physical characteristics than on its fertilizing value. Dry sludge can also be used for filling low land just as well as ordinary earth. In almost every case this method of disposal is the most economical, if it is not possible to use it for agricultural purposes Especially with cities which use their refuse for filling is this method of sludge disposal particularly adaptable, because the dry sludge has a volume only about one-fifth of that of the city refuse, and if a city has sufficient ground for dumping its refuse, there will also be sufficient area for the sludge. In cities where the refuse is burned, consideration should be given to the possibility of burning the dry sludge with the refuse. In such an event, however, there is the danger that the slag will not be so good. In addition to the incineration of sludge, it is not worth considering other methods of artificial disposal of dry sludge; such, for example, as using it for the production of gas or for the reclaiming of the fat contained in it. As incineration is carried out on a large scale only in one instance (Frankfurt-am-Main) it may be concluded that for the disposal of dry sludge there are left only the two natural methods—its use for agricultural purposes and for the filling of low land.

Methods of Drying.

From what has already been said, we may conclude that the best system of sludge disposal is that in which the sludge is first dried. There are, of course, difficulties connected with this drying. Science has, up to the present time, interested itself principally in artificial methods of drying. Of first importance in this connection is the pressing of sludge, which has been used for many years in England. The excess water in the sludge is pressed out through filter cloths. Sewage sludge can be pressed only when it is properly treated, for example, with lime or coal powder. This system is a good one, and for the foregoing reason is especially applicable to chemical precipitation works, where the chemicals necessary for the precipitation are added to the sewage. The cost of the system is, however, so high, that, outside of England, it has been used very little.

In comparison with sludge pressing, the centrifugal drying machines used in Germany (Frankfurt and Hanover), are a step in advance, since the fresh sludge is handled without the addition of chemicals. There is, however, the serious disadvantage that the water separated from the sludge is much more objectionable than in the case of sludge pressing. This water contains a very large part of the organic matter of the sludge. A more natural treatment, and one especially applicable for small plants, is the mixing of the wet sludge with drying matter, which absorbs the moisture. Refuse and street cleanings are especially applicable for this purpose if the sludge is to be used for agricultural purposes. The simplest of all methods of drying is just to discharge the sludge upon a drying bed, which should consist of 10 in. of porous material with a perfectly horizontal surface, and underlaid with drain pipes laid approximately 12 ft. c. to c. It must not be forgotten that there should be spread over the surface of the bed a thin layer of fine sand, which will have to be frequently renewed. This simple, natural arrangement for drying was formerly very little used, because all attempts to drain fresh sludge were unsuccessful. The sludge must first be made drainable. Without question, this can be done by artificial means, as with the addition of lime or coal powder, in the same way as with sludge pressing. But all these methods of drying are uneconomical.

Automatically, by itself, the sludge becomes drainable while undergoing a process of natural decomposition. We have known this fact for a long time from the "septic tanks," through which the sewage slowly flows, and as a result of being in contact with the decomposing sludge, becomes foul itself and smells. In comparison with these septic tanks, a step in advance was made by separating the decomposing sludge from the flowing sewage, by removing it into a separate tank. This idea of separate sludge decomposition was, so far as I know, first brought forward by H. W. Clark, of Boston, in the year 1899. It was not possible, however, in the experiments

*A paper read before the International Congress on Hygiene and Demography, held recently at Washington, D. C. Herr Karl Imhoff is probably the greatest European authority on septic tanks and sewage disposal.

made by Mr. Clark, as well as in other places, to effect, in a separate sludge tank, as good a decomposition as with the ordinary septic tanks. The first success along these lines was made in the year 1906 at the sewage disposal works of the Emscher Genossenschaft in Essen. The type of works referred to are spoken of as Emscher tanks, a special type of double-deck tanks, which consist of an ordinary settling chamber and a sludge-decomposition chamber below, through which there is no flow.

After a short ripening time, there was found in these sludge-decomposing chambers a sludge black in color, and with a slight odor of tar. In spite of small water content, ordinarily of about 75 per cent, the sludge flowed easily through pipes, and when spread upon a drying bed to a depth of 10 inches became firm and spadeable in a few days. The decomposition was practically odorless and the sewage flowing out of the settling chamber was totally unaffected by the decomposition of the sludge. Since we know that it is possible with separate sludge chambers to have the principal advantage of the septic tank, namely, the drain-ability of the sludge, the septic tanks have lost their importance. Their disadvantages, especially the objectionable odor of the effluent, render them impossible for many purposes. They are today suitable only for very small plants. In most cases it is desirable to keep the sewage fresh; in other words, to treat it in ordinary settling chambers, and to remove into a separate chamber only the sludge, which requires decomposition, in order that it can be easily drained and dried. It is not to be assumed that the Emscher tank is the only arrangement for bringing about these results. It is possible, without question, to bring about the natural decomposition, which takes place in Emscher tanks, with any properly built tank, filled in the right way with sludge, and operated according to certain principles. I do not know of any plants with separate sludge tanks, however, where exactly these results have been obtained. And it seems to me as if all possible scientific methods of bringing about these results, with plants in which the sludge is pumped from the settling tanks to special decomposition tanks, will be much more expensive both for construction and operation.

Practical Tests of Sludge.

In the sense of what has been said, good sludge may be considered as sludge which dries quickly and has no objectionable odor. The following information shows the possibility of easily determining the character of sludge.

Appearance and Odor.

Good sludge is black, and uniformly granular. It moves easily, it has a slight odor of tar or burnt rubber. Bad sludge is grey, full of fibres, soapy, sticky, and has a bad odor.

Adhesiveness.

A white enamel-lined dish pan is filled with sludge and then emptied so that only enough sludge remains to just cover the surface of the enamel. Good sludge will separate itself at once from the water, so that in 10 or 15 seconds the surface is broken up by white lines. Bad sludge sticks to the entire surface. The experiment is especially important because it gives the information at once.

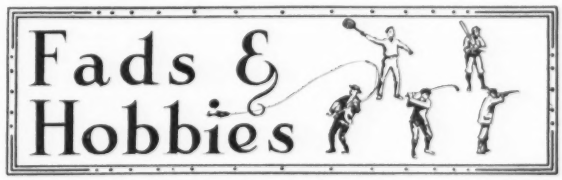
Gas Content.

Newly withdrawn sludge is placed in a measuring glass to a height of 1 ft. After six hours good sludge separates itself from the water which collects below the sludge. With bad sludge the water collects on top.

Sludge is placed on a sand filter to a depth of 10 inches. In the case of good sludge, considerable clear water will drain out in the first few hours. In three days, during dry weather, it will be firm and spadeable. With bad sludge, only a small amount of water drains out of the sludge, and this takes place very slowly.

Conclusions.

The two best methods of disposal of sludge are (1) its use for agricultural purposes and especially (2) filling of low land. In both cases the sludge must first be dried, and this is best effected upon a drying bed after the sludge has decomposed in an inoffensive odorless manner in a separate tank through which sewage does not flow.



He Used to Walk About.

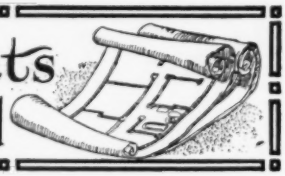
For a good many years a very excellent Ohio gentleman, answering to the name of Alfred C. Eynon, ran-about-on-his-feet transacting his business affairs, big or little. But, now he runs-about on four wheels. This method of navigation appears to have displaced almost altogether the good, old-fashioned method of foot locomotion in modern men of successful caliber.

Alfred C. Eynon and His Runabout.

It's a familiar sight down in dear old Canton, the home of the late William McKinley, to observe Al chu-chuing about that pretty town in his new run-about. There was a report, however, some time ago, that Al was seen traveling afoot—that he was detected running-about that new machine peeping high and low for the place that was out of order. We believe it's a lie, a prevarication of the truth, a distortion of veracity.

It was also darkly hinted in this report that Al (the first day he had the machine out) had to phone to the auto office a dozen times calling for help before he could start running about the beautiful little city of Canton again. We do not for a fraction of a minute entertain the thought that a past-president of the National Association would run a run-about out of order. No, no, ye gods and little fishes, we plumb refuse to believe it.

Contracts Awarded



Grand Forks, N. D.—Spriggs Bros. have been awarded the contract for the plumbing and heating of the new Curling Club building.

Toledo, O.—Frank Miller has secured the heating contract for the Toledo Glass Co.'s new factory. The contract amounts to $1,700.

Allentown, Pa.—Beck & Frey, of this city, have secured the contract for the installation of plumbing and heating systems in the fire station.

Scottdale, Pa.—Robert E. Griffith has secured the contract for the installation of a heating system in the new addition to the Moose Home on Broadway.

Clinton, Iowa.—Parker & Johnson have secured the contract for the installation of the plumbing and heating systems in George Smith's new residence.

Glens Falls, N. Y.—G. E. Adams & Co. have been awarded the contract for the installation of a modern heating system in Sherman's hall in this city.

Shamokin, Pa.—Balentine & Taby, of this city, have secured the contract for the installation of an up-to-date heating system in the new high school building.

Auburn, Neb.—C. A. Snider, of this city, has secured the contract for the installation of plumbing and heating systems in W. R. Denton's residence at Talmage.

Pascoag, R. I.—Maurice E. Moroney, of this city, has secured the contract for the installation of a heating system in the town hall at Upton. Consideration $748.

New Haven, Conn.—The Day & Lee Co., of this city, has secured the contract for the plumbing and heating in the New Haven Dairy Co's. new garage on Hazel Street.

Marshfield, Wis.—Wm. Kalsched, of this city, has secured the contract for the installation of plumbing and heating systems in H. L. Klemme's new residence at Stratford, Wis.

Catskill, N. Y.—Harry Boyne, of this city, has secured the contract for the installation of a new steam heating plant in John Smith's building at the corner of Water and Church Streets.

Toledo, O.—The Eagen Bros. Co., of this city, has secured the heating and plumbing contract for the new building of the National Supply Co. The job will amount to about $4,600.

Negaunee, Mich.—Joseph A. Thomas has secured the contracts for the installation of up-to-date heating systems in the residences of A. Martin and Alexander Noal at Crystal Falls.

Fort Wayne, Ind.—The Loeffler Plumbing Co. has secured the contract for the installation of a new heating system in the First Methodist Episcopal Church. Consideration $1,516.

Dallas, Tex.—Kinnison Bros. have secured the contract for the heating and ventilation, and the Hamilton Co. secured the contract for the plumbing in the new County Jail and Criminal Courts Building.

Moline, Ill.—The Moline Heating & Plumbing Co., of this city, has been awarded the contracts for the installation of plumbing and heating systems in the Moline high school building. The contracts amount to $37,134, of which $27,377 is for heating and $9,757 for plumbing.

Cincinnati, O.—Peck, Anderson & Peck have secured the contract for the installation of an up-to-date heating system in the new Gwynne Bldg., at the corner of Sixth and Main Streets, which is being built by the Vanderbilts.

Grand Forks, N. D.—The Spriggs Bros. Plumbing Co., of this city, has secured the contract for the installation of plumbing, heating and ventilating systems in the new Grand Forks county court house. The contract amounts to $12,237.

Atlantic City, N. J.—John J. Nesbit has secured the contract for the installation of a steam heating plant in the new Massachusetts Avenue school building. Consideration $18,000. Mr. Nesbit will also install a $3,400 heating system at 309 Atlantic Avenue.

Oneida, Wis.—The Oneida Heating & Plumbing Co. has secured the contract for the plumbing and heating of W. A. Brown's new residence on Frederick Street. This company has also been awarded the contract for the installation of a new electric pump at the county poor farm.

THE FIFTH ANNUAL SOCIAL SESSION OF THE PLUMBING INSPECTORS OF WASHINGTON, D. C.

The fifth annual social session of the Association of Plumbing Inspectors of the District of Columbia was held on Monday evening, December 1st, in the Grand Hotel, 15th Street and Pennsylvania Avenue, N. W., Washington, D. C., with 125 gentlemen in attendance. It is needless to state that an evening of much enjoyment was spent by the association members, master plumbers, guests, and supply and manufacturers' representatives present. The personnel of the Committee on Arrangements would promise that—read it: Chairman, Samuel Tapp; Frank Lockhead, entertainment; William B. Wall, finances; and Joseph D. Moriarity, refreshments.

The session lasted from 8:30 till 12:30 and the four hours passed with a whirl, so quickly did one thing follow another. While Mr. Moriarity was ever watchful for the interests at his end, the other members of the committee were also busy with their work, and to Mr. Lockhead is great credit due for the splendid entertainment pulled off. First he introduced a whistling duo, Messrs. Clarke Brothers, and followed this by vocal and instrumental selections, and impersonations. In all, it was a very clever program.

The membership of the association consists of present and ex-employees of the plumbing department.

Among the master plumbers present were: Messrs. John Welsh, Arthur W. Kaldenbach, Frank L. Marsden, Edwin C. Crouch, Gilbert H. Davis, J. H. Hall, Charles A. Dorset, William A. Blake, John W. Hurley, William H. McMahon, R. W. Lauman, Cornelius Regan, L. M. Rose, Walter D. Nolan, John J. Nolan, Charles Lauer, George F. McAvoy, Joseph A. Bauer, Charles H. Stein, Randolph Clarke, Richard A. Fitzgerald, John M. Connor, John A. Keppel, William Lauman, William J. Mooney, Frank Daly, S. S. Streb, R. M. Montgomery, G. G. Campbell, Robert Strobel, L. H. McKinley, Louis Conradis, A. B. Clemmer, Thomas F. Foley, John M. Curtin, Henry R. Eberly, Joseph A. High, Paul Bauer, William E. Bookhultz, David B. Jenkins, D. B. Gallagher, C. A. Brooke, John P. Robinson, Leo. C. Brooks, W. P. Latimer, James L. Clarke, Samuel Artz, William A. Brett, Thomas C. Clark, M. J. Colbert, Frank A. Kerr, D. J. Murphy, Daniel O'Connor, John L. Wege, P. F. Hannan, Frederick W. Quinter, D. H. Stevens, P. T. Niland, William Duffy, Thomas S. Tucker, E. J. McGolrick, Isadore Freund, Peter C. Schaefer, J. J. Lanahan, George W. Hanes, J. B. Clarke, Thomas O. May, Charles T. May, C. E. Rabbitt, Charles A. Appel and Edward Castnot.

Members of the Association present: Inspector of Plumbing Alfred R. McGonegal, Colonel Richard A. O'Brien, Messrs. Michael J. Fennell, M. J. O'Callaghan, George A. Crawford,

William A. Soarrow, Joseph D. Moriarty, Frank Wall, Samuel Tapp, William B. Wall, Frank Lockhead, Howell V. O'Brien, William A. Sweet, J. F. Brady, William R. Marsh, F. Borton Ridenour and Charles F. Tilp.

The guests of honor of the evening were: Colonel Chester F. Harding, the Engineer Commissioner of the District of Columbia, who has just lately been assigned to the District, having been transferred from his post at Panama; and Inspector of Plumbing Charles I. Putts, of Baltimore, Md.

And last but not least were the representatives of the different supply and manufacturers located in the District of Columbia: George J. Jones, C. P. L. Moran, J. A. Graney, H. A. Horstman and E. Rose, of the Crane Co.; Redmon S. Brennan and J. F. Brady, of the J. L. Mott Iron Works; Mr. Casey, of the Joseph Vogel Co.; C. T. Ford, of the H. Mueller Manufacturing Co.; James A. Messer, of the John Mitchell, Jr., Inc.; E. G. Schaefer and U. G. Cunningham, of the E. G. Schaefer Co.; Thomas Sommerville, of the Thomas Sommerville Co.; Morris L. Horner, of the Speakman Supply & Pipe Co.; and John K. Heyl, of the L. Wolff Manufacturing Co.

Fred Koehler, business agent of the local journeymen's union, was also present, as was W. Small, of the local water department.

CHICAGO NORTH AND WEST SIDE MASTER PLUMBERS' ANNUAL RECEPTION AND BALL.

"A splendid success" was the phrase used by everybody in attendance in describing the great annual reception and ball of the North and West Side Master Plumbers' Pleasure Club, held at the North West Hall, on the southwest corner of West North Avenue and North Western Avenue, Chicago, Wednesday evening, December 3rd. The weather being all that could be desired nearly all who had received invitations were in attendance making the event probably better attended than any of its many successful predecessors. The grand entree took place at nine o'clock, and more than one hundred master plumbers with their wives were in the brilliantly lighted hall before ten o'clock, when the grand march was scheduled to take place. Exactly at that hour the chief of the floor committee and his assistant, F. W. Page and Col. Fred. J. Wagner, respectively, had every couple present dressed with phantastic headgear of every description and lined up for the grand march which to the strains of an excellent orchestra was led by Mr. and Mrs. Frank N. Kiesgen, followed by Mr. and Mrs. P. Feltman, Mr. and Mrs. George Leebody, Mr. and Mrs. E. C. Wagner, Mr. and Mrs. Henry Breyer, Mr. and Mrs. C. C. Breyer, Mr. and Mrs. George Franklin and nearly one hundred other couples. At this point a surprise awaited the dancers in the shape of a heavy shower of confetti of many colors. This with the above-mentioned phantastic headgears and the fine-dressed ladies and gentlemen made the spacious hall a maze of moving colors exceedingly pleasing to the eyes of the spectators. The grand march was followed by waltzes, two-steps and quadrilles until one o'clock, when autos were found waiting for the merrymakers not only lining North Avenue but also North Western Avenue for some distance. Refreshments, provided by the reception committee, were served throughout the entire evening, and everything was done to make the affair the pleasant success it proved to be. The committees, whose efforts made the event so delightful, cannot be given too much credit for their splendid work. These committees were composed as follows: On Arrangements: George Leebody, chairman; E. C. Wagner and Fred J. Bohn. Reception: Henry Breyer, chairman; Geo. Franklin, assistant chairman; C. C. Breyer, J. C. Berndt, W. R. Black, L. Christianson, H. Diedisch, L. A. Clausen, Charles Dose, Adam Harvey, Luke Keefe, J. Kiessling, Otto Liss, W. F. J. Lutz, C. A. Manson, Charles Mundt, F. E. Pearson, Fernando W. Pripps, Frank J. Ruh, Joseph Scheuer, E. J. Timm, Wm. T. Wagner, Jacob G. Weber, W. G. Wood, Peter Schmitt and Paul Redieske. Floor Committee: F. W. Page, chief; Fred. J. Wagner, assistant chief; A. W. Bahn, W. F. Bahn, E. J. Benning, W. J. Blyth, Patrick Britt, Edw. Federly, Theodore Eckart, Fred. Grosch, Theodore Hawkswell, C. H. Jesperson, Paul Jacoby, Wm. J. Lang, W. F. Knauss, Louis Nelson, Robert Liss, H. J. Schaefer, D. J. Hickey, Wm. Redieske and John Boecher.—Among those who attended the affair from other parts of the city or from out-of-town places were: Chas. A. Dreier, president of the Chicago Association; C. J. Herbert, formerly member of the National Board of Directors, Wm. Gawne, Jr., of Oak Park; Harry Snow, of the Peerless Selling Co., and A. F. Irons, of Winnetka, Ill.

CALIFORNIA'S BEST KNOWN MASTER PLUMBER.

John L. E. Firmin, for many years secretary of the San Francisco and California Master Plumbers' associations, celebrated two anniversaries last week at his home in San Francisco. On Tuesday, November 25th, it was 38 years since he was married, and on Wednesday, November 26th, he celebrated the 65th anniversary of his birth. Many of his friends both in California and throughout the

John L. E. Firmin, of San Francisco.

country congratulated him on reaching those two important milestones on his journey through life. Mr. Firmin is still at the height of his power both mentally and physically, and he is very active in association matters. At the present time he is occupied with the authorship of a clear and concise interpretation of the California Workmen's Compensation Law for the benefit of his fellow-members in the Master Plumbers' State Association. He is a confirmed convention delegate and he has probably attended more national conventions than any other Californian. We are therefore not very much mistaken when we call him "California's Best Known Master Plumber," and he has an exceedingly large number of friends in all parts of the country.

Convention Dates

January 27, 28 and 29, 1914.—The twenty-second annual convention of the Illinois Master Plumbers' State Association, at Rock Island, Ill. The officers of the association are: President, W. J. Hilliard, Elmhurst; first vice-president, C. D. Brownell, Champaign; second vice-president, John L. Robertson, Mason City; treasurer, O. W. Dawson, Decatur; secretary, W. C. Haviland, Coulter Block, Aurora, Ill.

February 17, 18 and 19, 1914.—The twenty-third annual convention of the Ohio Master Plumbers' State Association, at Cincinnati, with headquarters at the New Gibson House. The officers of the association are: President, F. W. Sponseller, Canton; vice-president, James A. Wood, Toledo; secretary-treasurer, Eb. Ellen, Cleveland.

March 9, 10 and 11, 1914.—Annual convention of the Indiana State Association of Master Plumbers, at Lafayette, Ind. The officers of the association are: President, Wm. J. Woolley, Evansville; vice-president, Joseph G. Hayes, Indianapolis; secretary-treasurer, A. E. Werkhoff, Lafayette, Ind.

April 21 and 22, 1914.—Annual convention of the Pennsylvania State Association of Master Plumbers, at York, Pa. The officers of the association are: President, D. F. Durkin, Philadelphia; vice-presidents, George W. Palmer, Lemoyne; Robert Purse, Johnstown; E. D. Swoyer, Allentown; treasurer, John H. Birchall, Allentown; secretary Harry L. Righter, 5424 Germantown Avenue, Philadelphia.

New Business Ventures

Earlville, Ill.—E. W. Malley & Co. is the style of a new plumbing and heating firm in this town.

Fort Wayne, Ind.—The Schwegman-Wittee Co., of this city, has been incorporated to conduct a plumbing and heating business. The incorporators are J. Schwegman and A. H. Wittee.

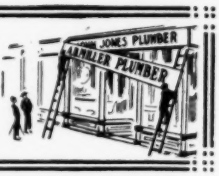
Brooklyn, N. Y.—The plumbing and heating firm of Rogers & Tully has been incorporated with a capital of $2,000. The incorporators are: James Rogers, William H. Tully and A. Rogers.

Cleveland, O.—The Schnitzer Plumbing Co., of this city, has been incorporated with a capital stock of $10,000. The incorporators are: Al. Schnitzer, Julius Rothschild, E. J. Thobaben, M. A. Morris and Emil Metzel.

Louisville, Ky.—The National Plumbing Co., of this city, has been incorporated with a capital of $3,000, to conduct a general plumbing business. The incorporators are: E. J. Winstell, Charles A. Wickliffe and Fred H. Miller.

Don't invest in cheap plumbing and lavatory fittings. If you do, you'll soon discover it to be the most "expensive" economy you ever tried.—"The National Builder."

Business Changes



Marshall, Ill.—Robert Findley has purchased the plumbing and heating business of Shipe & Payne.

Ashland, Mass.—Franklin Enslin & Co. have sold their plumbing and heating business to Greenwood Bros.

Central Valley, N. Y.—Charles E. Jones has sold his plumbing business and stock to Theodore Jones and Charles H. Jones, of Highland Mills, N. Y.

Obituary

John J. Collins.

John J. Collins, a contracting plumber of Brooklyn, N. Y., died at the home of his sister in that city on Tuesday, November 25th, in his 46th year.

Charles E. Harris.

Charles E. Harris, formerly in the plumbing business at Bayshore, L. I., died at his home in Brooklyn, N. Y., on Wednesday, November 26th, in his 40th year. His widow and five children survive him.

Morris Alphers.

Morris Alphers, of the plumbing firm of Alphers & Jacobs, of 445 Morris Avenue, Newark, N. J., was caught in a cave-in Friday afternoon, November 21st, when supervising a water supply connection job on Sherman Avenue in that city. He was dug out in fifteen minutes but died from suffocation a few minutes after being admitted to the City Hospital.

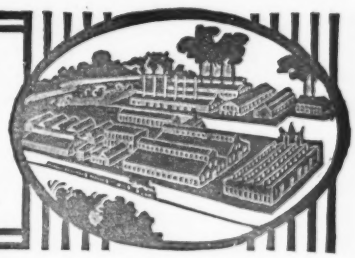
Thomas P. Hughes.

Thomas P. Hughes, manager of the Colorado Lead Works, Denver, Colo., and formerly president of the Hughes & Keith Supply Co., died at the home of his niece, Mrs. H. H. Howard, 1565 Franklin Street, Denver, on Sunday, November 30th, from heart disease, in his 66th year. Mr. Hughes was born in Liverpool, England, and came to this country with his parents, when he was only a few years old. He never married and he is survived by one brother and two sisters.

Edmund Friedrich Borman.

Edmund Friedrich Borman, of the plumbing firm of E. F. Borman & Co., of 115 Church Street, Plainfield, N. J., died at the home of his parents in that city Sunday morning, November 23rd, in his twenty-ninth year, after several months' illness. He was born in Mt. Horeb, N. J., September 20, 1885, learned the plumbing trade and conducted a plumbing business in partnership with his brother for the last few years. He was a member of the Plainfield Master Plumbers' Association and had many friends in the trade who regret his early death. His parents, five brothers and two sisters survive him.

Among the Wholesalers and Manufacturers



WILL MANUFACTURE HEATING SPECIALTIES.

The Reynolds Valve Co., of Rochester, N. Y., has been incorporated with a capital of $20,000, to manufacture heating specialties. The incorporators are: Charles H. Reynolds, Edward S. Osborne and Matthew Elliott, all of Rochester, N. Y.

WOLVERINE BRASS WORKS INCREASES CAPITAL STOCK.

The Wolverine Brass Works, of Grand Raids, Mich., has increased its capital stock from $500,000 to $700,000. This increase was necessitated by the marked increase in the company's business during the last few years.

WILL DEAL IN PLUMBING AND HEATING SUPPLIES.

The Belmar Supply Co., of 807 F Street, Belmar, N. J., has been incorporated with a capital of $25,000 to deal in plumbing and heating supplies. The incorporators are: P. C. Taylor, C. Taylor and M. W. Crane, all of Belmar, N. J.

LAWSON MFG. CO. TO BUILD NEW PLANT.

The Lawson Manufacturing Co., of Homestead, Pa., will erect a new plant for the manufacture of gas water heaters, and plans for the building have been ordered. In addition to a main factory the company will also erect a new office building. The cost will be about $50,000.

LARGER QUARTERS FOR THE CANADIAN H. W. JOHNS-MANVILLE CO., LTD.

The Toronto branch of the Canadian H. W. Johns-Manville Co., Limited, announces its removal to more spacious quarters at No. 19 Front Street, East. This new store and warehouse has a floor area of approximately 35,000 sq. ft., and is situated in the heart of the wholesale district. In its new quarters the company will be able to carry a larger stock and have ample space for the display of its line of J-M Asbestos packings, pipe coverings and plumbing specialties, etc. The entire building will be lighted by its Frink and J-M linolite system of lighting and one room will be used for exhibiting these systems of lighting.

THE DECEMBER MEETING OF THE ILLINOIS CHAPTER OF A. S. H. & V. E.

The Illinois Chapter of the American Society of Heating and Ventilating Engineers will hold its regular monthly meeting on Monday evening, December 8th, at the Great Northern Hotel, Chicago, in the dining room on the second floor, and dinner will be served at 6 p. m. sharp, at $1 per plate. The topic of the debate at this meeting is: "Forced Circulation of Hot Water versus Direct Steam Vacuum Heating for Industrial Plants." R. A. Widdicombe will lead the "Forced Circulation" forces, and E. B. Gordon will defend "Steam Vacuum Heating."

EASTERN SUPPLY ASSOCIATION HONORS ITS FORMER PRESIDENT.

In conformity with the resolution adopted at the annual meeting of the Eastern Supply Association, held in New York City, October 8, 1913, authorizing President L. O. Koven to appoint a committee of three to select and present to the retiring president, P. M. Beecher, of Syracuse, N. Y., a remembrance of the esteem and regard of his fellow members, President Koven named D. L. Hamill, Joseph F. Evans and John A. Murray as the committee. On Thursday morning, November 13th, Messrs. Hamill and Evans journey to Syracuse, Mr. Murray being unable to be present. These two gentlemen were met at the Onondaga Hotel in Syracuse by C. F. Bennett, assistant general manager of the Pierce, Butler & Pierce Mfg. Co., who took them over to the company's plant, where they found Mr. Beecher and Messrs. Pierce, Butler and Crane. This entire party was then invited to Mr. Beecher's home, where a course dinner was served. After dinner Mr. Hamill, chairman of the committee, in the name of the Eastern Supply Association, presented a beautiful hall clock to Mr. Beecher, expressing to him the high regard in which he is held by his associates. Mr. Beecher in responding expressed great pleasure in being honored by the Association and he requested Mr. Hamill to give his fellow members his best wishes and assure them that he would always have the interests of the Association at heart. Mr. Evans then conveyed his warm appreciation to Mr. Beecher for his services to the Association. This was followed by several pleasant hours in a most enjoyable social visit, which will be remembered with pleasure by every one fortunate enough to be present.

E. W. SANBORN HONORED WITH DINNER.

E. W. Sanborn, who recently resigned as assistant general manager of sales for the United States Radiator Corporation was given a farewell dinner at the Griswold Cafe in Detroit on Saturday evening, Nov. 29th. The dinner was arranged by the heads of departments and the executive force of the corporation and was a total surprise to Mr. Sanborn, who had no had advance notice of the spread. Each and everyone of the twenty gentlemen present endeavored to make Mr. Sanborn understand just how they regretted to see him leave them. During the dinner he was presented with a token of remembrance in the form of a set of Thermo bottles packed in a handsome leather case particularly adapted to Mr. Sanborn's touring car.

Personal Mention

G. K. MacEdward, advertising manager of the Detroit Lubricator Company, of Detroit, Mich., read an excellent paper on "What the Consumer Wants in Lubrication," at the annual convention of the National Gas Engine Association, at Toledo, O., on Thursday, December 4th.

R. O. Warrington, with headquarters at Manila, Philippine Islands, was a Chicago visitor this week and dropped into an easy chair in the office of "Domestic Engineering" for a few minutes. Mr. Warrington is representing a number of American manufacturers and is in this country making arrangements for additional lines to present to the wholesalers in the Philippines and China. Mr. Warrington is well known by many in the trade as having formerly been in charge of the San Francisco branch of the Good Mfg. Co.

Frank Van Inwagen, secretary of the Illinois Engineering Co., Chicago, can easily trace his particular branch of the family tree back to the landing of the Pilgrims and can boast of ancestors who were mighty hunters and really had a hand in paving the way for the red figures that appear on present-day calendars, along the latter part of November. Even though very few wild turkeys make their appearance in the loop district of Chicago, the spirit of the mighty hunter is still strong in the Van Inwagen blood. Frank sallied forth from his offices for lunch one day last week and evidently encountered a flock of the national birds and was unable to resist a shot or two. He can now boast of being a real shooter as he was back at his office in little less than one hour with two beautiful "turks" as the prize.

THE CONSTRUCTION OF THE "WELLS" PIPE WRENCHES.

The "Wells" pipe wrenches, manufactured by the F. E. Wells & Son Co., of Greenfield, Mass., are made to stand the strain of service without deterioration and to test this claim the company invites close investigation. The accompanying illustration shows one of this company's new improved wrenches with a strengthened jaw drop-forged and tempered in such a way that it does

The Improved "Wells" Pipe Wrench.

not only give the strength which comes from the additional material at this point but this reinforcement is produced without materially increasing the weight. The different parts of these wrenches are strengthened to stand the severe strain to which they may be subjected in emergency work. To prevent the wood handles from breaking, double ferrules and selected wood only are used in the construction of these wrenches, and the metal part of the handle is also drop-forged, and not a casting, making it doubly sure to stand hard usage. Parties interested in these tools can obtain complete information from the manufacturers upon application, mentioning "Domestic Engineering."

BROOKSIDE SELF-CLOSING PLUMBERS' BRASS GOODS.

The Brookside Brass Foundry & Manufacturing Co., of 2315 Selzer Avenue, S. W., Cleveland, O., has just issued a most attractive catalog illustrating and describing its line of self-closing plumbers' brass goods, including Doherty bibbs and stops, pantry and basin cocks, and urinal cocks; Boston bibbs and stops, pantry and basin cocks with T handle; Boston basin cocks and bibbs with China index 4 ball handle; Boston basin cocks and bibbs with wheel handle; ball-bearing shower valves, ice water cocks, star-handle basin cocks and bibbs, 4-ball handle cocks and

The Brookside Ball-Bearing Self-Closing Basin Cock.

bibbs, top-lever handle basin cocks and bibbs, T handle basin cocks and bibbs, solid China cross handle basin cocks and bibbs, etc., etc. The accompanying illustration taken from this catalog will give the reader some ideas of the quality of the half-tone engravings used in the book as well as of the graceful lines of the company's products. It shows the Brookside ball-bearing top-lever handle, self-closing basin cock with china index, semi low down, which is furnished finished or nickel-plated, with porcelain or brass handle. The company has been in business since 1901 and having these many years specialized in the manufacture of self-closing plumbers' brass goods, it has passed the experimental stage long ago and makes goods with a ten-year guarantee. Readers, who can make use of the above catalog, can obtain a copy of it from the Brookside company upon application, mentioning "Domestic Engineering."

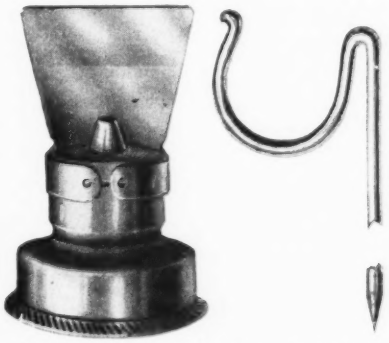
THE DEWEY HOT WATER THERMOSTAT.

The Dewey Hot Water Thermostat, shown in the accompanying illustration, is manufactured by R. E. Dewey, of Grand Rapids, Mich., who describes it as being a device to govern the temperature of the water in hot water heating systems in connection with electric heat regulators in accordance with climatic conditions. If for instance, the weather is near the freezing point, the hot water thermostat can be set at from 130 to 140 degrees and when the temperature of the water reaches that point, the drafts will close, regardless of the temperature of the room, and this temperature will be maintained until the required temperature is reached in the rooms. The draft will then remain closed as long as this temperature is maintained, no matter how low the temperature of the water goes. When the temperature in the room falls below the point at which the room thermostat is set, the drafts will open and bring the temperature of the water to the point at which the water thermostat is set. This often takes place before there has been any perceptible change in the room, but the temperature soon reaches normal again. There will in this manner be a saving of fuel for the reason that the lowest temperature, carried on the heater, necessary to bring the room temperature to the required degree, will cause only the minimum amount of fuel to be consumed. Interested parties, who do not know this thermostat, can obtain complete information from the manufacturer upon request, mentioning "Domestic Engineering."

The Dewey Hot Water Thermostat.

THE "DUO" NOZZLE AND LAWN SPRINKLER.

The H. B. Sherman Manufacturing Co., of Battle Creek, Mich., has just placed on the market a new combination nozzle and lawn sprinkler under the classical trade name of "Duo," the Latin word meaning "two." This



The "Duo" Nozzle and Lawn Sprinkler.

nozzle has no shut-off and its use therefore prevents the breaking or bursting of the hose and the subsequent loss to dealers, jobbers and manufacturers through its return. It throws either a straight stream or a spray without the necessity of a shut-off and both stream and spray contain an equal and exceptionally large amount of water. A glance at the accompanying illustration will give the reader a clear idea of its construction and how it can be used either as a lawn sprinkler or a nozzle. The spray is produced after the water has passed through the nozzle, hence the quantity of water is not at all reduced. The nozzle part of this device is made of wrought brass finished both inside and outside, and it is therefore a most attractive, if not ornamental device for the show-window, and the manufacturers state that it affords dealers a neat profit. Readers of "Domestic Engineering," who have not yet seen this combination nozzle and lawn sprinkler, can obtain complete information upon request, mentioning this paper.

THE VAPOR-VACUUM AND PRESSURE SYSTEM.

"The Vapor-Vacuum and Pressure System" is the title of a neat and well-written booklet just issued by J. F. Engelhart, of 86-88 Edgewood Avenue, Atlanta, Ga., illustrating and describing this system in detail. This system of heating is the invention of practical steamfitters with many years experience. It requires no air valves on the radiators, one large air vent being used in the basement which removes all the air in the system and discharges it into the flue. This air vent has a vacuum attachment which, while it allows all air and no steam to escape from the system, will not allow any air to enter. The draft in the flue draws the air from the system as effectively as a vacuum pump would do it. Mr. Engelhart will be glad to send interested parties this booklet upon request, mentioning "Domestic Engineering."

The Metal Market

Lower Prices for Copper.

Consumers of copper both in Europe and the United States refuse to buy until conditions are more settled. There is a wide difference of opinion relative to the value of metal, as for example, a carload of Lake copper was sold at 16c while two days later it could have been purchased at 15.50c. This is the lowest price reached on this movement. A corresponding decline in Electrolytic brings the price to 14.75c, New York. Consumer stocks are exceedingly meagre and this is true both in Europe and the United States. Consumption abroad is relatively better than in this country and exports during November aggregated 29,000 tons.

Lead.

The market is weaker with practically no business, the metal being quoted at 4.30c New York, and 4.15c St. Louis.

A Waiting Iron Market.

Consumers of iron in all parts of the country are not buying for future needs and, for their present requirements they have sufficient material on old orders at higher prices to supply their needs for the full month of December. As prices have gradually dropped from week to week, there is no incentive to buy and the absence of large consumers is taken as an indication that the market has not yet reached bottom. It is evident that the orders of the U. S. Steel Corporation will show another large

decrease this month and it is doubtful if any gain will be made until well along in 1914. At bottom, the situation is much better, as a great many of the weak spots have been cleared up. Orders for rails in November amounted to 160,000 tons, 50,000 tons more than October, new cars ordered numbered 6,300, or half of those placed in October, but there was a better business in locomotives, for over 200 were purchased. It is estimated that so far this year 108,000 cars have been bought, compared with 225,000 for the corresponding time last year.

Quotations of pig iron are lower, as follows:

No. 1 Northern Foundry, New York	$15.50 to	$15.75
No. 2 Northern Foundry, New York	15.25	15.50
No. 2 Southern Foundry, Cincinnati	13.75	14.25
No. 2 Northern Foundry, Cincinnati	14.75	15.25
No. 2 Southern Foundry, Birmingham	11.00	11.50
No. 2 Northern Foundry, Chicago	14.75	15.00

Old Metals.

New York dealers' buying prices are:

Light copper	$11.00 to	$11.25
Strictly crucible copper	12.25	12.50
Uncrucibled copper wire	12.00	12.25
No. 1 brass turnings	7.00	7.25
Cocks and faucets	8.75	9.00
Light brass	6.25	6.75
Heavy yellow brass	7.25	7.50
Heavy lead	3.70	3.80
Tea lead	3.40	3.50
Close cut solder joints	7.00	7.25

BUILDING FALLS OFF 15 PER CENT.

Ninety-seven principal cities show a loss of 15 per cent in building operations in October in comparison with the corresponding period a year ago. Official reports to Construction News from ninety-seven cities show that permits were taken out in October for 21,517 buildings, aggregating in cost $56,082,966, against 22,887 buildings, involving a total cost of $66,242,248 for the same month a year ago, a decrease of 1,370 buildings and $10,160,282. The figures in detail are as follows:

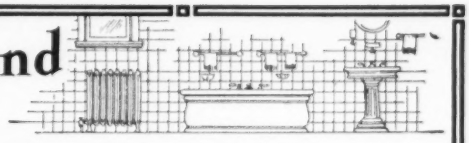
	1913		1912	
Cities—	No. of Bldgs.	Estimated Cost.	No. of Bldgs.	Estimated Cost.
Chicago	1,020	$9,314,000	1,178	$8,745,600
Boston	442	4,583,000	449	5,797,000
New York (Boros Man. and Bronx)	395	3,349,497	370	4,722,489
Detroit	809	3,079,540	846	2,544,005
Philadelphia	1,294	2,716,850	1,406	3,644,225
Brooklyn, N. Y.	914	2,553,080	1,123	3,379,847
Cleveland	1,034	1,979,075	954	1,916,260
Los Angeles	1,460	1,701,550	1,646	2,677,780
Kansas City, Mo.	317	1,540,705	416	893,335
Buffalo, N. Y.	419	1,347,000	481	1,616,000
Minneapolis	551	1,240,950	514	1,117,380
Milwaukee	350	1,210,123	423	1,189,766
San Francisco	552	1,118,280	562	1,722,860
Toledo	257	868,165	215	404,553
St. Louis	736	820,073	800	1,454,125
St. Paul	387	804,252	309	869,946
Albany, N. Y.	261	781,965	283	365,575
Oakland, Cal.	348	777,387	465	836,169
Rochester, N. Y.	314	735,403	373	915,121
Baltimore	287	697,606	252	1,019,554
Portland, Ore.	631	681,710	627	1,026,885
Newark	217	675,530	262	773,748
Washington, D. C.	381	660,932	558	803,123
Hartford	131	608,505	107	422,865
Columbus	271	590,005	264	341,983
Indianapolis	454	573,048	444	757,445
San Diego	292	563,779	477	884,319
Dallas	159	519,435	137	274,875
Worcester, Mass.	131	494,044	148	739,509
Seattle	831	474,190	799	374,045
Akron	270	463,425	238	490,845
Utica, N. Y.	167	457,702	73	180,122
New Bedford, Mass.	117	388,000	97	170,000
Sioux City, Ia.	70	360,662	50	156,965
Atlanta, Ga.	335	338,340	413	2,115,667
Louisville	210	332,580	252	534,010
Springfield, Mass.	108	327,498	122	434,995
Omaha	91	297,025	109	225,365
Peoria	57	291,909	42	151,875
San Antonio	290	275,405	358	221,245
Portland, Me.	30	258,164	47	137,965
Grand Rapids, Mich.	165	257,863	126	218,092
Birmingham	368	254,741	324	252,375
Dayton	75	252,225	70	196,550
Sacramento	137	236,245	94	385,378
Brockton, Mass.	44	223,435	62	179,265
New Haven	97	214,785	123	399,465
Duluth	142	212,452	106	178,785
New Orleans	...	208,750	...	187,632
Youngstown	75	207,680	112	246,730
Wilkes-Barre	55	206,687	71	281,104
Memphis	306	196,990	316	750,891
Elizabeth, N. J.	62	180,405	60	165,339
Erie, Pa.	84	179,813	144	348,873
Paterson, N. J.	53	172,605	88	159,587
Salt Lake City	73	171,795	57	209,476
Berkeley	109	158,050	105	222,950
Ft. Wayne, Ind.	59	155,385	69	227,415
Harrisburg	37	153,610	32	51,175
Davenport	49	149,900	35	88,100
Richmond, Va.	87	147,060	88	426,520
Spokane	78	140,340	109	145,330
Evansville	110	137,286	126	229,925
Pasadena	168	133,920	148	198,024
Somerville, Mass.	29	132,660	33	193,350
Savannah	71	129,010	77	145,150
Trenton	83	127,921	121	178,234
Wilmington	64	123,902	53	189,207
Tampa, Fla.	136	114,163	...	119,753
Springfield, Ill.	35	110,015	32	78,815
Stockton, Cal.	52	108,668	32	75,275
Reading, Pa.	35	103,125	32	88,975
Scranton	38	102,251	69	126,216
Ft. Worth	...	96,050	47	139,950
East St. Louis, Ill.	68	92,615	40	41,566
Chattanooga	215	89,470	215	57,840
Lincoln, Neb.	47	89,037	45	74,525
Allentown, Pa.	40	79,900	41	561,550
Syracuse	41	78,985	110	390,778
Norfolk	56	77,384	68	348,513
Nashville	45	73,496	50	65,518
Kansas City, Kan.	77	69,030	50	54,675
Passaic, N. J.	27	65,825	35	60,510
Lawrence, Mass.	20	63,000	21	93,400
St. Joseph, Mo.	56	61,128	77	112,325
San Jose	55	60,027	61	104,075
Topeka, Kan.	52	51,695	65	76,267
Pueblo	17	44,889	20	38,518
Holyoke, Mass.	20	44,500	20	290,300
Charlotte, N. C.	35	41,100	26	76,232
South Bend	28	40,250	29	131,617
Lowell	43	38,965	50	111,490
Saginaw	42	36,529	23	20,875
Colorado Springs	35	20,750	28	129,861
Bayonne, N. J.	9	19,933	35	108,845
Bridgeport, Conn.	...	18,573	102	253,414
Hoboken	23	16,414	20	16,073
Total	21,517	$56,082,966	22,887	$66,242,248

There is apparently a temporary contradiction all along the line, evidence of which is to be found in the fact that there were losses in 56 cities and gains in 40. Singular as it may seem all the large cities show a considerable decrease with the exception of Chicago, in which there was an increase of 6 per cent. The falling off in New York was 29 per cent, Boston, 21, Philadelphia 25, Brooklyn 24, St. Louis 43, Buffalo 16, St. Paul 7, Baltimore 32, Washington 17, Indianapolis 24, Atlanta 83, Louisville 37, New Haven 46, Memphis 74, Salt Lake 18, Fort Wayne 32, Richmond, Va., 88, Savannah 11, Wilmington 34, Scranton 19, Fort Worth 31. The principal Pacific coast cities show material losses, including Los Angeles 43 per cent, San Francisco 34, Portland 33, San Diego 36, Sacramento 41, Berkeley, Cal., 29, Spokane 3, Pasadena 32, San Jose 42.

Notwithstanding the foregoing, there were some bright spots, including Chicago with its gain of 6 per cent, Detroit 21, Cleveland 3, Kansas City 72, Minneapolis 11, Milwaukee 2, Toledo 114, Albany 113, Hartford 43, Columbus 32, Dallas 81, Seattle 23, Sioux City 129, Omaha 30, Peoria 92, San Antonio 24, Portland, Me., 87, Grand Rapids 14, Dayton 28, Paterson, N. J., 8, Duluth 18, New Orleans 11, Davenport 70, Springfield, Ill., 30, Stockton, Cal., 39.

As to the future, it is believed that while there may be a little more contradiction there is no reason why there should be any material period of depression, for the reason that the substantial mercantile and industrial institutions are prospering as they have never prospered before the temporary contraction from which the country is now suffering, being confined to certain elements of the commercial life, which must find the cure within themselves.

Among the Plumbing and Heating Contractors



Illinois

Chicago.

Otto Liss, of 1987 North Robey Street, has recently secured the contract for plumbing a two-story apartment building to be erected at Polwun Place and Manor Avenue.

Gus B. Cromley & Co., 4205 West 22nd Street, have been awarded the contract for plumbing installation in an eight-flat building to be constructed at 65th Street and University Avenue.

The plumbing for a store and printing building to be erected at 621 South Clark Street will be installed by John Glotzbach, of 321 West Washington Street.

The Riley Plumbing & Heating Co. is the title of a new firm at 6420 Cottage Grove Avenue. They have an excellent display room and an up-to-date shop.

The contract for installing the heating system in an eighteen-flat building to be constructed at 4624-46 St. Lawrence Avenue, has been awarded to P. J. Callahan, 9830 Howard Court.

Schampel & Baldwin, 173 West Washington Street, have recently secured the contract for installing the heating system in a large store to be built at 219 East Twenty-third Street.

George Hendricks, of 5536 Broadway, has been awarded the heating contract on an apartment building to be erected at 1457-9 Catalpa Avenue.

The heating system in a store and printing building to be erected at 621 South Clark Street, will be installed by the L. H. Prentice Co., of 320 Sherman Street.

Ira O'Malley, of 79 West Lake Street, has recently been awarded the plumbing contract for a factory to be built on Larchmont Avenue for Bell & Howell.

Onas Harris, of 4004 Cottage Grove Avenue, has secured the contract for plumbing a store at 219 East Twenty-third Street.

The Robinson Furnace Co., which has for the past twenty-six years been located at 65-67 East Lake Street, has leased from Clara F. Bass, the four-story and basement building at 205-207 West Lake Street.

Michigan

Detroit.

Owing to the inclement weather which has been in evidence for the past two weeks, contractors have not been able to make very fast progress with their work and as a consequence, the plumbing business has suffered. During the month of October, statistics show that it rained 16 days, and a greater percentage of rainy days applies to the month of November.

This is the last month of 1913 and according to leading plumbers, it will wind up a most successful year for everybody in the industry. There is not a single plumber in the city who does not report a greater volume of business for 1913 than in any previous year, and as for 1914, prospects are exceedingly bright. Detroit has not been booming in the past few years; instead it has been growing at a healthy pace, and is bound to continue along those lines. The city has diversified interests and is not dependent on any one of them.

Orvine & Meier, of 406 Meldrum avenue, have been awarded the contract to install the steam heating and plumbing in the theatre building being constructed at the corner of High and Hastings Streets.

A. W. Schultz is installing the plumbing and heating in the elegant residence of A. J. Dunneback on Boston Boulevard. Mr. Schultz has also the plumbing and heating contract for a large brick warehouse being erected at West Grand Boulevard and the Michigan Central Railroad.

Architects French and Fleischer, 49 University Building, are preparing plans for a six-story building to be built on Park Street, near Bagg, to cost $45,000.

O'Connor Bros., 297 Grand River Avenue, are very busy these days endeavoring to finish up a lot of small work before starting on a number of larger contracts which they were recently awarded. They have the plumbing and heating for the new North Building of the Kiefer Hospital as well as the plumbing and heating for building No. 2 which is to undergo alterations and remodeling.

Other Cities in the State.

Fire which did little damage threatened to completely destroy the plumbing establishment of Thomas Shields, 311 East Michigan Avenue, Lansing, on November 26th. Owing to good work on the part of the fire department, the blaze which originated in the sub-basement, was quickly put out. The cause of the fire is unknown. Mr. Shields left everything in apparently good shape when he locked up.

Architect George D. Stone, Widdicomb Building, Grand Rapids, is drawing plans for a furniture exhibition building that will cost $350,000, to be ten stories high and 100 by 150 feet in size. The actual building will probably not be started before spring. Grand Rapids is probably the greatest furniture manufacturing city in the country, and twice a year local as well as manufacturers from other cities make displays of their goods. Retailers are brought to these exhibitions from every corner of the globe. The present structure used for this purpose has been lacking in space for sometime, and a new and larger building is very much desired.

Architect J. G. Gastler & Co., Chamber of Commerce, Detroit, is preparing plans for a store and apartment building that will cost $38,000.

Joseph A. Thomas, of Negaunee, was recently awarded several good-sized contracts for residence plumbing and heating systems.

Carl Riggins, of Oconto, has been awarded a contract for installing new heating and plumbing systems in the residence of Isaac Stephenson, jr., in Menominee. The heating system contract amounts to $2,250.

Kentucky

Louisville and Vicinity.

The Louisville Master Plumbers' Association is looking forward to the annual election of officers which is to be held at the meeting of December 15th. Nominations were made at a recent meeting, and members of the Association are carefully considering the tickets put up, with a view to maintaining the high standards of efficiency set by the present corps of officers.

The big McCrory Five and Ten-Cent Store, on Fourth Avenue, was opened on Wednesday, December 3, the various contractors getting through with their work by herculean efforts. F. S. Schardein & Sons finished up the heating plant early in the week, and M. J. Duffy & Sons Co. the plumbing, which included the difficult work of installing the soda-fountain, a day or so later. The management insisted upon the completion of the work in time for the holiday trade, and although the time was short, the contractors delivered the goods.

M. J. Duffy and his several sons, particularly Will Duffy, are feeling particularly fine just now, as a result of the victory of the Louisville Male High School's football team over that of the Louisville Manual Training High School in the annual Thanksgiving game between the two. Will Duffy, a graduate of the former institution several years ago, and a famous football player both at school and in college, has coached his old school's team for several years with conspicuous success, the victory this year, however, being more gratifying than usual, on account of the fact that it was rather unexpected, judging from the weights and records of the two teams.

Among the needs of the Kentucky School for the Blind, located at Louisville, is a new heating plant, and the Legislature which meets in January will probably make an appropriation for that purpose. The committee of the board which will present this matter to the Legislature is headed by Thomas D. Osborne, of Louisville.

Bids will shortly be asked by the Treasury Department on the installation of fifteen lavatories for a number of offices in the Federal building in Louisville. At the present time running water is found in only two offices in the big building. It is hoped to have the contracts let forthwith, and have the work finished by Christmas.

Pennsylvania

Pittsburgh and Vicinity.

New building in the East End district, Pittsburgh, Pa., gives early promise of being rather extensive this season, all of which is of interest to the plumber, heating and steam fitting contractors. Nine brick houses are to be built by Frederick Bauer at Aurela and Putnam Streets, and $20,000 will be spent by L. D. and W. E. Smith in the erection of 10 brick dwellings on Sphar and Alder Streets. In addition to these $50,000 building contracts several new apartment houses are also to be erected in the East Liberty district ere long.

The plumbing firm of Weldon & Kelly has been awarded the contract for the plumbing of the new public school being erected at Avalon, Pa.

The Allegheny General Hospital contemplates spending $150,000 in erecting a four-story addition to its present hospital building. Plans will be ordered in January, and work is to be started in the spring.

The McGinnis-Smith Co., of Twenty-second Street, Pittsburgh, has secured the heating contract for the addition being built to St. Elizabeth's Hospital at Youngstown, O.

Plans are being drawn by Architect U. J. L. Peoples, of the Vandergrift Building, Pittsburgh, for the new Loyal Order of Moose lodge and club rooms to be erected on Penn Avenue. A large swimming pool will be a feature of this building, in addition to the regular heating and plumbing contracts.

Philadelphia and Vicinity.

Geo. B. Grey, 16 South 17th Street, has been awarded the plumbing and heating contract in the new apartment house which is being erected at the corner of 40th and Locust Street, for Geo. B. Hoad.

Talley & Wenzel, 1911 Commerce Street, have been awarded the contract to make extensive alterations in the plumbing and heating in the properties at 310 and 320 Spruce Street, for Weightman Estate. Consideration, $2,500.

Hirst Bros., Tacony, Pa., have been awarded the plumbing and heating in the new Catholic Church which is being constructed in that town.

W. P. Smith, 4326 Frankford Avenue, has been awarded the plumbing in 14 new houses which are being erected at the corner of Bener and Wissinoming Avenue, for H. A. Hargraves.

Boon & Sample, formerly of 17th and Filbert Streets, have opened up an elaborate show-room in their new business home at 1715 Arch Street.

M. K. Frey, 807 Spring Garden Street, is making extensive alterations in the plumbing work at the German Hospital.

C. Bieling, 3218 Frankford Avenue, has been awarded the plumbing in the three new stores which are being erected at the corner of Frankford and Clearfield Streets.

Edw. Haab, 414 Susquehanna Avenue, is doing the underdraining in ten houses on Kensington Avenue and is also doing considerable heating work in new houses.

Massachusetts

Springfield.—Proposals for plumbing, heating, ventilating and vacuum cleaning apparatus for the Buckingham school addition have been asked by the city council committee on city property. Bids must be in by December 22nd, but the committee reserves the right to defer the awarding of the contract for one month if it wishes.

Clinton.—J. H. Boxford, a well-known heating engineer, has advised the town of Clinton to install a central heating plant for the town hall, library, Walnut Street school, high school, Chestnut Street school and one other smaller building in the immediate vicinity. Mr. Boxford believes such a plant would result in saving thousands of dollars.

North Adams.—The Varley House at Riverside, formerly a hotel, is being remodelled into a six-tenement dwelling house. The necessary new plumbing is to be done by F. H. Sherman.

Haverhill.—New building ordinances, containing provisions governing plumbing work and inspection, are being drafted by the city council. At a recent meeting the matter of plumbing provisions was discussed at length and the plumbing inspector, D. X. Coakley, was asked to prepare amendments covering the subject. Special ob-

California

San Francisco and Vicinity.

For the last few weeks the plumbing business has been gradually settling down to the normal winter condition, as rainy or threatening weather has prevailed most of the time, delaying general construction work, and many plumbing jobs have been held up. Moreover, it is very difficult to get money for any kind of private building operations, and new contracts are slow in coming out. The number of buildings being figured or planned for construction next spring is steadily increasing, but it is not believed that the situation will change greatly before the end of the year. Of the jobs immediately in sight, one of the largest is the Hobart building, on which the general construction contracts are now coming out. Plans are also about ready for a fourteen-story office building on Montgomery Street, for which J. M. Haenke, of Los Angeles, is the architect.

While building at Los Angeles has been rather quiet for the last two months, the outlook there is improving. Francis J. Baker spent several days in the southern city this week to look after the interests of the Tay Company in connection with a large hotel job for which contracts are now being signed. Another important Los Angeles job on which figures are being taken is the main office building of the Pacific Telephone & Telegraph Co., on South Hill Street, to cost about $230,000. Contracts are also being let for the large railway station of the Southern Pacific Railroad, which will be one of the best equipped on the Coast. Plans are also being prepared by Architects Garrett & Farrell for a Class A building for the French Hospital Association, to contain 25 rooms.

An example of modern logging camp equipment is shown in a new camp of the Stephens-Bird Lumber & Logging Company, near Monroe, which is equipped with electric lights, steam heat, shower baths and drying rooms. The difficulty of getting satisfactory labor for winter operations in the northern climate is leading many of the logging concerns to equip their camps with modern heating and bathing facilities.

J. C. Dunn, of the Fillmore Plumbing & Hardware Co., of Fillmore, Cal., has bought the interest of his partner, W. P. Wyman. Mr. Dunn reports that the tank department is especially busy just now, and that he plans to make some improvements in that department in the near future.

The Wheeling Sheet & Tinplate Co. has placed its tinplate account for California with W. A. Taylor, Rialto Building, San Francisco. Mr. Taylor will continue to represent the LaBelle Iron Works.

Henry Ernst & Sons have taken the contract for plumbing in connection with the remodeling of the Emma Brun Building on O'Farrell Street, near Gough.

The contracts on the proposed addition to the Mills Building on Bush and Montgomery Streets, on which a number of local houses have been figuring, were let a few days ago. These included: With the Peterson-James Co., plumbing, $6,275; with Mangrum & Otter, heating system, $3,400; with the United States Metal Products Co., roofing and sheet metal work, $2,375; and the Thomas Day Co., lighting fixtures.

J. Looney, the well-known San Francisco plumber, submitted the only bid received for the plumbing work on the Oakland, Cal., jail at the City Hall in that city. Mr. Looney submitted a bid of $7,960 for the work if done

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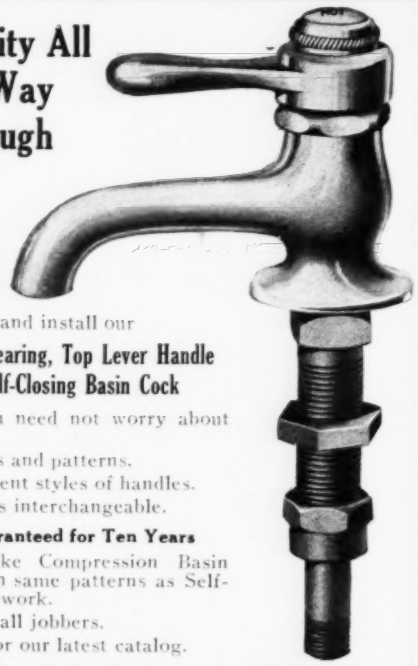

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Saves You Money.

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Gadsden, Alabama

Makers of Good Soil Pipe and Fittings

on the original plans, and he also submitted an alternate bid of $7,860. The bids were taken under advisement.

Work is progressing satisfactorily at the Panama-Pacific Exposition site. Bids were received this week on the general contract for the New York building, which will cost in the neighborhood of a quarter of a million dollars. The contracts for the heating plant and the electrical work will be let separately.

It is given out that the December appropriation of the War Department for construction work at the Presidio reservation in this city is $600,000. This will be mainly for the construction of new barracks. Plans and specifications for the sewer system at Fort Mason are completed, and bids will be called for soon.

Other Cities in the State.

The Board of Education of Pittsburg, Cal., which is now having plans drawn for a new school building to cost approximately $50,000, announces that separate plans and specifications for a modern heating and ventilating system will be made.

Plans are now well under way for the new high school buildings at San Bernardino, Cal. The buildings will cost in the neighborhood of $200,000, and will include a central heating plant and gymnasium.

The general contract for the second wing of the new Los Angeles County Psychopathic Hospital has been awarded to the F. O. Engstrom Company of Los Angeles. The first wing is now in the hands of the plumbers.

The Columbian Iron Works of Chattanooga, Tenn., has been awarded a $13,989 contract for fire hydrants, valves, etc., required for water-works improvements in the city of Riverside, Cal. All bids for pumps have been rejected, the municipality having decided to have this work done by its electric light department.

The Golden State Pump Co. recently incorporated at Pomona, Cal., for the manufacture of the Burton automatic compressed air pump, has opened offices in that city.

"I" vs. "WE."

A man in charge of a plant, or any man having men under him, will secure better results if he does not try to be self-important, but uses a little tact. Men under the direction of another are quick to appreciate consideration at his hands even in small ways. For example, it is just as easy to say, "We must get this work done today," as to say, "I want that work done today," and the chances are much more favorable that the work will be done. The use of "we" encourages co-operation, keeps the men interested by suggesting that they have a share in the responsibility, and is gratifying to them because it does not remind them of their inferior position.

It's a pleasure to work under a boss who makes you feel that you are working *with* him rather than *under* him. He is the kind that encourages the men to make suggestions in regard to the work, realizing that every man under him knows something that he does not know.

When the boss shows interest in his men he will find they will show interest in him.—*Power*.

Two Irishmen were discussing the various books they had read.

"Have you read Karl Gjellerup's "The Pilgrim Kamanita?"

"I have."

"Have you read Marie Corelli's works?"

"I have that."

"Have you read 'Looking Backward?'"

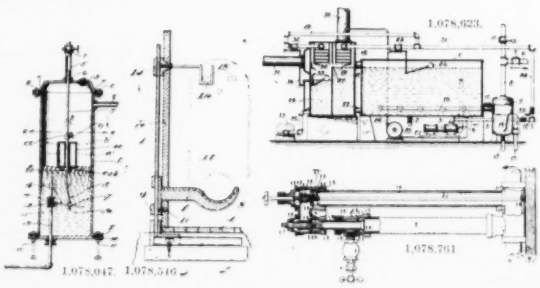
"How on airth could I do that?"

Patents

Heating Department.

1,078,047. Steam Trap. Edward F. Jones, St. Joseph, Mo. In a steam trap, a cylinder having a steam inlet and provided with an outlet pipe having a valve, said valve having an arm movable therewith, a nipple tube including an air cock connected to the cylinder, a rod movable in said cylinder with its upper portion slidable in the nipple tube and having a lower flexible end, a collar mounted on said arm to which the lower extremity of said flexible end is pivotally connected, said collar adapted to be adjusted in different positions to vary the throw of the valve including a device for holding the same adjusted; a float slidable on said rod, a collar on said rod above its flexible end and fixed below the float, a second collar arranged adjustably on said rod above the float and with which adjustable collar said float contacts when raised by the accumulation of water in the cylinder to move the rod vertically.

1,078,546. Radiator. Daniel J. McCarty and Harry B. McGinnis, Chicago, Ill. The combination with a radiator, of a supporting member inclosed in a wall of a building; an arm on said member projecting through said wall and adapted to engage and support the lower portion of said radiator; and another arm on said member projecting through said wall and adapted to engage and support the upper portion of said radiator, substantially as described.



1,078,623. Water Heating Apparatus. John C. Jones, Joseph W. Gamble and Horace E. Gibson, Philadelphia, Pa., assignors to Harrison Safety Boiler Works, Philadelphia, Pa., a Copartnership of Pennsylvania. The combination of a chamber, a pipe connected thereto adapted for connection to a boiler so that the contents of the boiler may be discharged into said chamber, means for withdrawing the water from the bottom of said chamber, a tank, a pipe connecting the upper part of said chamber with the lower part of said tank for carrying steam from the chamber to the tank, a heater having a water-chamber in the lower portion thereof, a connection between said heater at a point above the water-chamber therein and the upper portion of said tank, a pipe for supplying water to said heater, a valve in said pipe, a float within said tank controlling said valve, a connection between the water chamber within said heater and said tank, a pipe for withdrawing water from said tank, and means independent of said pipe for maintaining a circulation of the water from said tank through said heater, substantially as set forth.

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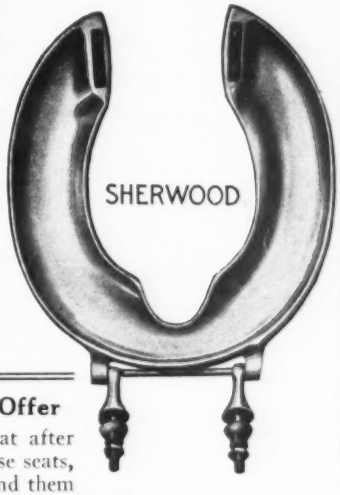
Absolutely Sanitary

The Unqualified Choice of Many Architects and Sanitary Engineers.



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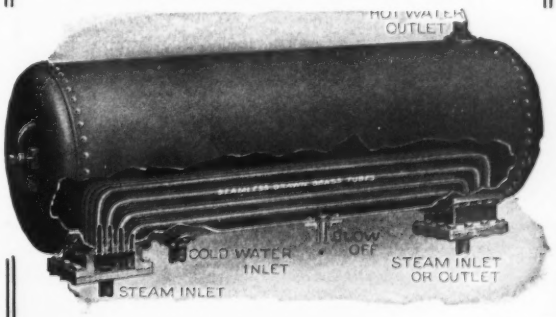

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The Patterson has no leaky return bends or coils. It contains a number of tubes whose area is always greater than the steam pipe—hence, condensation is discharged as rapidly as it forms, securing full benefit of the heating surface.

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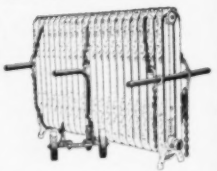

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pays for itself on the first job.

No matter where radiation is desired you will find our **Carrier** saves labor, time and strength.

It is justly **known everywhere as the steamfitter's best friend.**

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The Turbine Ejector Pump

The Latest and Best Vacuum Pump For All Vacuum Heating Systems

Applicable to both return line and air line vacuum systems.
Contains neither pistons, valves, springs, belts, gears nor pinions.
Noiseless in operation. Automatically controlled.
Economical in power consumption.
Practically unlimited life, needing no expert attendance.

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Sole Manufacturers **Hoboken, N. J.**

You Can Make Friends and Money

by installing the

Horigan Aqua Expansion Tank

Reduces cost of installation.
Only expansion tank needed on Hot Water Systems.
Placed beside boiler—saves piping to attic.
Smaller pipes—2-in. mains, ½-in. and ¾-in. risers.
More heat—less fuel.
For old or new work. **Cures a sick job.**
Cheapest and best heat generator on the market.
Price, only $11.50.
A trial order will convince you.
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HORIGAN SUPPLY CO.
ST. JOSEPH, MO.

DAD PIPE HANGER

Dad Says,

The Moon might be made of Green Cheese, but what he wants to know is, who gave it a-whey!

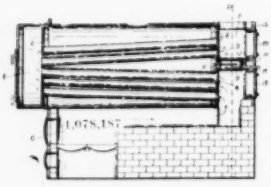
There are no secrets about the DAD PIPE HANGER. It is the simplest and cheapest hanger on the market. Is easily adjusted, durable and efficient.

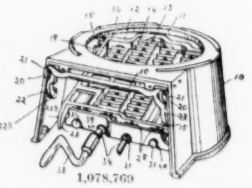
Dad says if you don't find his Hanger equal to the best at less than half the price, you can return it and he'll pay the freight both ways.

If your jobber cannot supply you, write us.

D. A. DONOVAN
Auburn, N. Y.

1,078,761. Heating System. Elmer E. Allbee, Arlington, N. J., assignor, by mesne assignments, to Standard Heat and Ventilation Company, Inc., New York, N. Y., a Corporation of New York. In a heating system, in combination, a radiating system, a feed conduit leading thereinto, a source of steam supply for said feed conduit, a discharge conduit leading from said radiating system and normally discharging freely into the atmosphere, an injector member carried by said discharge conduit and extending within said feed conduit, and forming a communication between the feed and discharge conduits, a portion of said injector member constituting with said feed conduit a valve, the differential expansion or contraction between said feed and discharge conduits operating to open and close said valve, means for adjusting said injector member whereby steam will be freely admitted into the radiating system, a valve between the discharge and feed conduits, and a valve for closing said discharge conduit, adapted to be automatically opened and closed by the contraction and expansion of said discharge conduit to regulate the discharge from the radiating system in accordance with the interior heat conditions of the system.





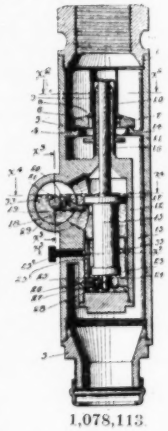
1,078,187. Steam Boiler. Alfred Catchpole, Geneva, N. Y. In a steam boiler, the combination of a shell having heads on the opposite ends thereof and smoke boxes at each end of the boiler, an upper and lower set of flues extending between said heads of the boiler, said lower set of flues being inclined upwardly toward the front of the boiler, said boiler having a large water space between the bottom and the front end of said flues, said upper set of flues being inclined upwardly toward the rear of the boiler, a partition arranged across the head of the boiler at the rear and extending outwardly therefrom, said partition separating the lower part of the smoke box from the upper part of the smoke box, said partition being composed of water tubes arranged in a single row, said tubes being connected to the head between the upper and lower sets of flues and being placed practically in contact with each other and forming practically a solid partition.

1,078,769. Grate. George E. Camp, Utica, N. Y., assignor to International Heater Company, Utica, N. Y., a Corporation of New York. A casting, a grate frame movably mounted therein and having rear bearings and open-sided front bearings, grate bars having their rear journals mounted in said rear bearings and their front journals inserted in said front bearings through the open sides thereof, each grate bar having forward of its front journal two shoulders spaced apart with an annular groove therebetween, and a plate having recesses extending upwardly from its lower edge and adapted to be lowered over said grate bars when the grate frame is in lowered position and have said recesses fit into said grooves and retain said bars in their bearings and be retained from longitudinal movement on said bars by said adjacent shoulders and locked from upward movement from said grate bars when the frame is in normal position by said casing.

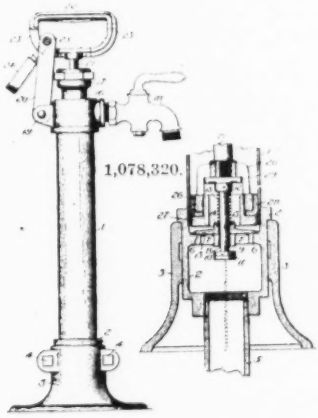
Plumbing Department.

1,078,113. Flushing Valve. John L. Williams, Los Angeles, Cal. In a flushing valve, a vertical outer barrel having a water inlet at its upper end and a water outlet at its lower end, an inner barrel within the outer barrel and having no communication therewith, a valve in the outer barrel for controlling the passage of water therethrough, mechanism within the inner barrel having an operating connection with said valve for controlling the movement of the valve, said connection extending through the upper end of the inner barrel, oil within said inner barrel for co-operating with the mechanism therein and for lubricating the same, and means between said upper water inlet and said connection for preventing water which enters the inlet from flowing down along the connection and entering the inner barrel.

1,078,320. Pump. James H. Stratton, Salem, Ohio, assignor to The Deming Company, Salem, Ohio, a Corporation of Ohio. In a valve mechanism for pumps the combination with a plunger valve and a lower pump valve the latter provided with a drain port therethrough, of an auxiliary vent valve normally closing the underside of said port, an auxiliary valve stem projecting upward through said port, and means under control of the pump plunger rod for simultaneously opening said plunger valve and vent valve.



1,078,113



1,078,320.

1,078,797. Flushing Apparatus. Harmon De Leon Moise, Sumter, S. C. In a flush tank, a liquid supply, a valve therefor, an auxiliary valve for causing said valve to operate, manual means for opening said auxiliary valve, detent means engaging said manual means to hold said valve open and means for automatically releasing said detent and reseating said auxiliary valve.

1,078,939. Combination Faucet. William H. Miller, John E. Miller, and William H. Orgel, Cleveland, Ohio. A faucet body having delivery spouts and a passage through said faucet corresponding to each spout, a valve for each passage and a free disk shaped member bearing against said valves, a spring bearing against said member and tending to close the valves and a coupling on the faucet body having an annular bearing and seat for said spring.

1,078,943. Float Valve. Philip Mueller, Decatur, Ill., assignor to H. Mueller Mfg. Co., Decatur, Ill., a Corporation of Illinois. The combination with a tank, of a supply pipe therefor, the end of which projects through the bottom thereof, a straight hollow stud located within the tank and detachably connected to the end of the supply pipe, a valve casing detachably connected to and swiv-

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On Self-Closing Hydrants Means It Is Frost Proof

Notice the way this hydrant is marked, with the name running up and down on the body.
If it's marked that way you are sure it is a GENUINE MURDOCK and that it will work under any regular working pressure.
Every Genuine MURDOCK is thoroughly tested before it leaves us and that assures positive action under all conditions and makes a satisfied customer every time.
Mr. Practical Plumber, be on the safe side by making sure it is a GENUINE MURDOCK.

The Murdock Mfg. & Supply Co.
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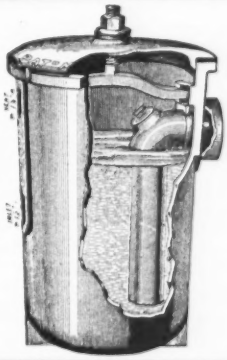
Caught!

We beg to announce that
In a Boston Grease Trap

there is held fast all grease from Bostonese kitchen sinks—that the waste pipes are absolutely free and can never be grease-clogged.
The BOSTON GREASE TRAP is easy to install—very simply constructed, durable, and can be quickly and easily cleaned. Why not write us for a detailed description?

R. Estabrook's Sons
South Boston, Mass.



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18 x 22 INCH SIZE

Showing in detail all of the ordinary Piping Systems for Steam and Hot Water Heating, and ten of the leading Vacuum and Vapor Systems. Each Chart thoroughly explained by notes.

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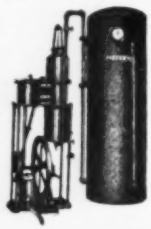
MASTER PLUMBERS

No matter what the requirements of the country and suburban home, there is a

CALORIC NOISELESS ENGINE



adapted for the work.

Because of its safety, simplicity and lack of noise, the "Caloric" is suitable for use in the home for pumping purposes.

Makes no more noise than a big clock.

The "Caloric" is in a class by itself for pumping water.

Price extremely reasonable.

You can make good money handling the "Caloric" in your locality.

Write for Catalog "C" and our agents proposition.

THE BREMEN MANUFACTURING COMPANY, Bremen, O., U.S.A.

DIXON'S GRAPHITE PIPE JOINT COMPOUND

Makes absolutely tight-joints which never set. Ask for sample and booklet No. 37

Joseph Dixon Crucible Co.

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A CONDENSATION PUMP AND RECEIVER

should have no Floats controlling it, as the Floats crack and become water logged from the great changes in temperature. The Pump bearings should not be lubricated by the water pumped as the hot condensation water will cause them to expand and stick

Write for our latest Catalog D describing how a condensation pump should be built to be reliable.

Chicago Pump Company, 903 W. Lake St., Chicago

Manufacturers of *Turbine House and Bilge Pumps, Sewage Ejectors and Electric Cellar Drainers.*

Floor Flanges Eccentric Reducers
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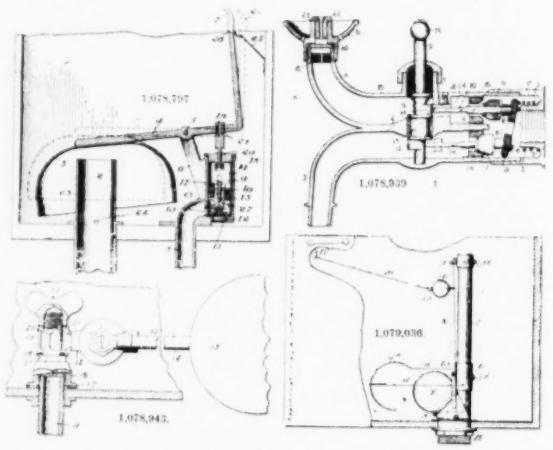
M O D E R N
IRON WORKS QUINCY, ILL.

Bugs don't like this adjustable boiler stand. It gives them no roosting place. To plumb boiler, insert wedge under slide piece. Why pay the same price for a stand of the ordinary kind? Height, 13¾ inches. Weighs about 6 lbs. Get jobber's price for lots of 100 or more.

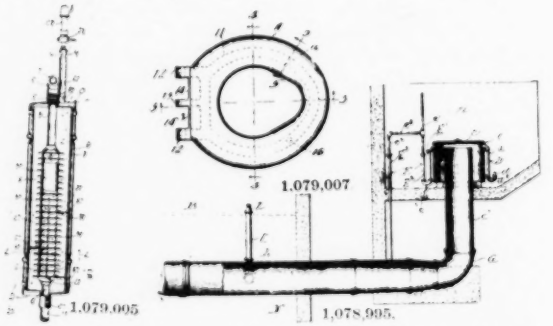
C. H. FOSTER
14 Princeton Ave. ST. LOUIS, MO.

eled upon said stud and in continuous communication with the supply pipe through said stud, means for holding said valve casing in place upon the stud, a valve carried by said swiveled casing and operating in a line substantially at right angles to the axis of said stud, and a float connected to the stem of said valve, substantially as described.



1,079,036. Flush-Out Valve. Agostino Tosco and Paul Salina, San Francisco, Cal. In a flushing apparatus of the character described, a tank, a vertical overflow pipe located therein and a flushing discharge pipe with which said overflow pipe connects at the lower end, a valve seat connecting with the discharge pipe out of line with the overflow and at an angle of approximately forty-five degrees, a buoyant spherical valve, an open wire cage by which the valve is normally directed upon the seat, an arm contracting with the ball, and lever connections by which the arm is actuated to throw the ball diagonally out of line with the seat, the upper member of said cage forming concave rests to retain the ball until the water level is depressed sufficiently to allow the ball to disengage and return to its seat.

1,079,005. Water Heater. Cyrus A. Haas, St. Louis, Mo. In combination with a boiler having intake and discharge means for a circulating medium, an outer casing surrounding the same and spaced therefrom, suitable sur-



face-exposing formations on the outer walls of the boiler, intake and discharge openings for hot gases formed in the casing respectively at opposite ends thereof, means detachably coupled to said formations for deflecting the gases at various points of their traverse through the space around the boiler, and means for causing said gases to hug the boiler walls.

1,079,007. Water Closet Seat. Herman M. Hoelscher, Chicago, Ill., assignor to L. Wolff Manufacturing Com-

pany, Chicago, Ill., a Corporation of Illinois. A water closet seat of the character described, composed of rubber of an inferior grade and having a metal reinforcing member embedded therein, said seat being provided with an outer polished veneer surface of a better grade of rubber, substantially as specified.

1,078,995. Siphon. Edward S. Chase, Reading, Pa., assignor to Pacific Flush Tank Company, Chicago, Ill., a Corporation of Illinois. In an apparatus for the purpose stated, the combination with a receptacle and a surface to be sprayed, of a siphon for discharging the contents of said receptacle, a liquid delivery pipe connected with the lower end of the discharge limb of the siphon and forming a continuation thereof, said delivery pipe extending therefrom beneath the surface to be sprayed, and a riser communicating at its lower end with said delivery pipe and provided at its upper end with a spray nozzle, said riser being adapted to form with said discharge limb and the intermediate portion of the delivery pipe, a seal or trap for the siphon.

THE VALUE OF TRADE EXHIBITS OF ALL KINDS.

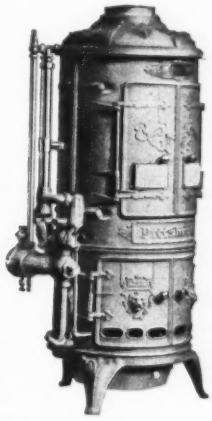
The editor's pessimistic friend had a new grievance. "I tell you," he exclaimed, with firm conviction, "there's something wrong with the entire modern system of education. Now here's an example. I was dictating the other day about a planing machine, and my stenographer writes it with two 'n's' you know, 'planning.' So I tried to tell her what a planing machine was. But she'd never heard of one; had never seen one. And she's a graduate from our public schools." Then the editor began to think. After all, his pessimistic friend's criticism was based on the assumption that anyone of any intelligence whatsoever was intuitively acquainted with simple implements of joinery. That in turn assumed a gone-by state of civilization; a house with a woodshed in which resided the carpenter's bench with its liberal supply of ordinary tools. For, a generation ago, as often as occasion required, the average householder was his own "handy-man." Now, whatever may be its other advantages, where in the average Harlem flat is the wood-shed? Where, even, is the tool chest? Is not the pessimist's stenographer the helpless product of her city life? The everlasting fact remains, however, that some knowledge of how things are done is as necessary an elment in ordinary human intelligence as the ability to extract cube-root. Nevertheless, how such knowledge may be obtained is today a vexing question. Processes are no longer simple and homemade. The farmer's work bench is not an urban solution. Undoubtedly in years to come, vocational and trade training will supply such defects for those who have chosen a mechanical following. But until that happy time, and for those who do not purpose becoming wheel-wrights or printers—?

This situation provides the real excuse for trade exhibitions of all kinds; theirs is a genuine reason for being, a splendid opportunity for usefulness. Curiosity to hear and see new things, and to learn how they are done, will last "while this machine is to us."

C. M. Masters, Mankato, Minn., is installing the plumbing in the high school at Tracy, Minn.

P. J. Gallagher, Faribault, Minn., was awarded the plumbing and heating contract in the St. Dominic Church at Northfield, Minn. He also is installing the heating and ventilating system in the new high school building at Tracy, Minn.

Efficiency, Simplicity Durability



these characteristics dominate the entire construction of the improved Type A. F. S. V. "Pittsburg" Automatic Gas Water Heater.

¶ "Pittsburg" workmanship is well above the standard; keen discrimination is exercised in the purchase of material, and the inspection tests through which every heater leaving the factory must pass are exceptionally rigorous and thorough. Were it otherwise, the broad guarantee back of the "Pittsburg" could not be made with confidence, and you could not conscientiously recommend it to discerning consumers.

¶ The gas and temperature regulation of the "Pittsburg" is accomplished with a **Single Gas Valve Seat in a Single Gas Valve Chamber.** This feature is found in no other heater and is a decided improvement over the more complicated double valve control. A **third safety feature** is also incorporated in the mechanical control.

Ten Exclusive Mechanical Features

are found in the "Pittsburg", an incorporated cast iron draft deflector, a scientifically staggered and graduated copper heating coil with a **reversed** detachable fire section, bonnet-top burners, detachable galvanized drip pan, open base, outside coil connections, exterior vertical temperature regulator, single seat gas valve, and center regulated cotton packed non-stickable water valve with a third safety feature. The "Pittsburg" is the only triple controlled Automatic Gas Water Heater now on the market.

Catalog P will be sent on request.

Pittsburg Water Heater Company

Pittsburg, Penn. and all large cities

PROMPT SERVICE HOT WATER

You Can't See

in the picture the genius and labor, the money and patience it cost to produce the Harrington pipe-threader.

But you can see what can be accomplished by this perfect tool. One feature alone will cause the user of this Die Stock to call down blessings upon the head of the maker—no kit of tools is required to take it apart or reassemble it!

Distinguishing the Harrington and the Harrington Alone —

——A steel cam ring is in continuous contact over the entire raceway of the die, making sure, perfect, radial action, concentric with center.

——All steel working parts.

——Malleable cast die body.

——Cuts 10 threads in range of 5 sizes of pipe with 3 sets of dies.

——Cuts right and left with same die or double-ended rights or double-ended lefts if desired.

You'll be a thankful user always if you use the Harrington once.

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By B. H. Jessup

Every item in a heating estimate should be a matter of detailed record. There is but one way to keep such a record, and that is by the use of a suitable printed form.

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combines the printed blank in a cloth bound book, suitably indexed for quick reference. The details concerning each individual room are carried out in full, space is provided for every detail concerning the building, and all the various miscellaneous items entering into the job are provided for.

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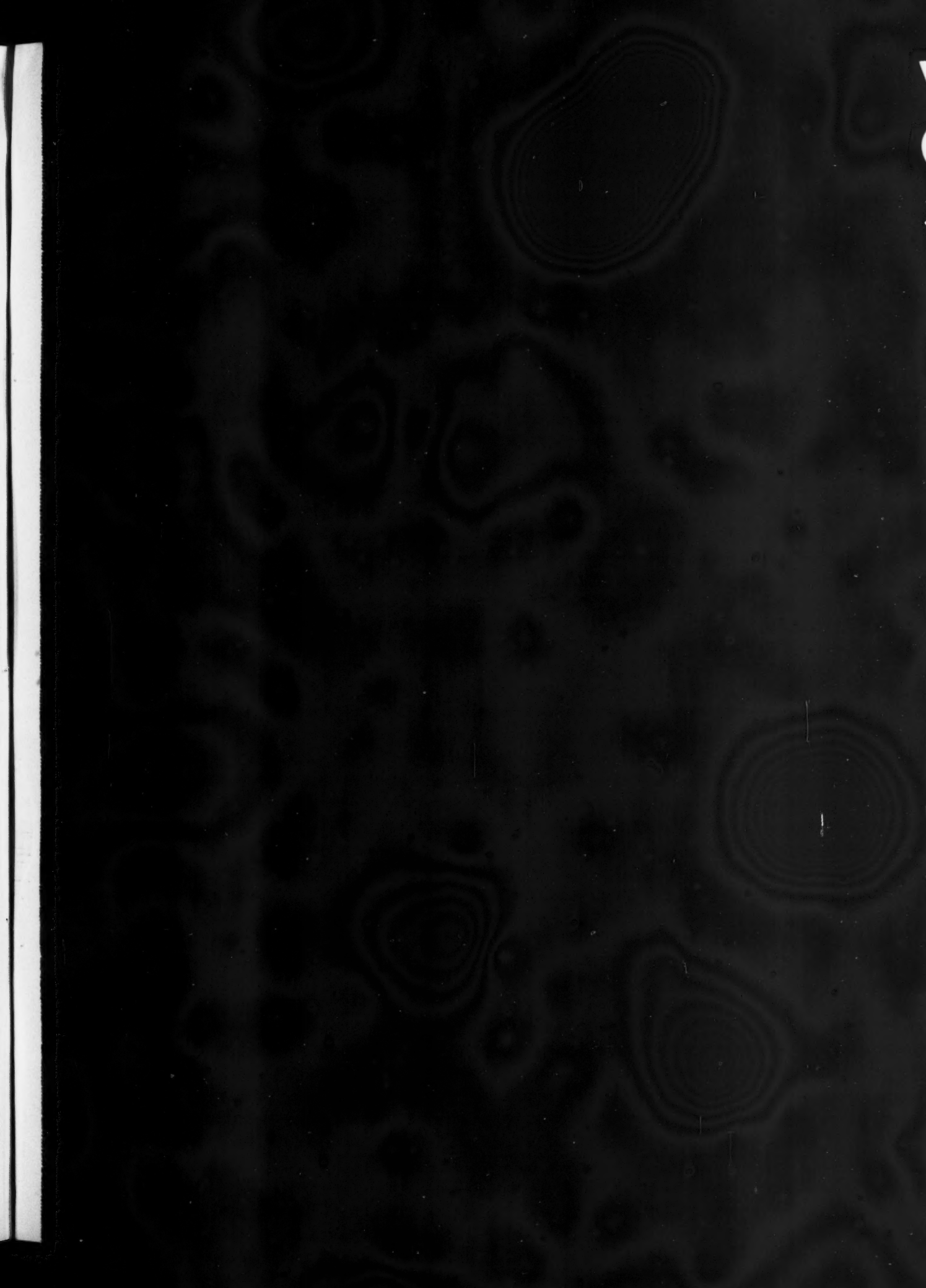
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